



**ASTRAL**<sup>®</sup>  
*where INNOVATION flows*

**STRONG NAHIN, ASTRAL STRONG!!**<sup>™</sup>

## ULTRA MODERN DRAINAGE SYSTEM

Technical Manual



PUSH FIT SYSTEM



EASY INSTALLATION



MAINTENANCE FREE



LONGER LIFE



COST SAVING



**ASTRAL**<sup>®</sup>  
**UNDER**  
**GROUND**  
DRAINAGE SYSTEMS

For Residential & Commercial Applications



## BENEFITS

- Push Fit System
- Easy Installation
- Maintenance Free
- Longer Life
- Cost Saving



## APPLICATIONS

ASTRAL Underground® drainage system is ideal to be used in single house application to multi floors buildings, hotels, hospitals, shopping malls, academic institutes upto the main lines.

Over the years ASTRAL® is committed to introduce innovative plumbing products in Indian market to better serve plumbing industry. ASTRAL® provides next generation integrated drainage solution using latest manufacturing technology.

For many years drainage engineers and contractors have been forced to make a traditional methods to make drainage system of a building. ASTRAL® offers Underground drainage system with strength and durability, installation speed, long term performance, cost effectiveness and superior quality of a complete drainage system.

ASTRAL Underground® drainage products are manufactured using state-of-the-art production technology which provides comprehensive range of robust, lightweight and extremely durable drainage products with unparalleled long term performance.

## KEY FEATURES

### Strength :

Long term stiffness and strength

### Durable :

Never corrode and hence meant for long life performance

### Flexibility :

Various molded and fabricated fittings for easy of installation and flexibility

### Installation :

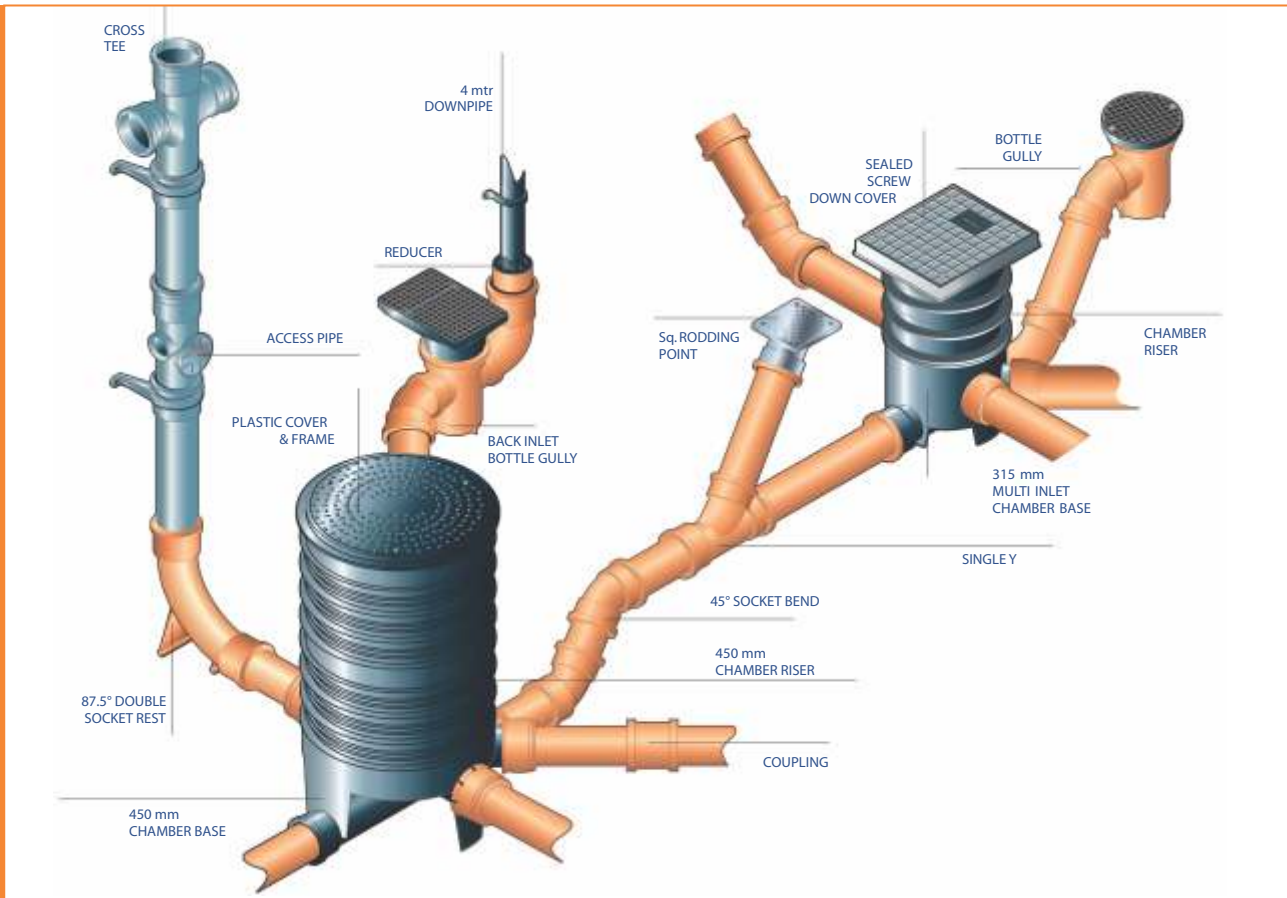
Easy and quick installation compared to traditional drainage system

### Cost benefits :

Reduced installation cost



# ASTRAL® INSPECTION CHAMBERS



ASTRAL Underground® system is completely watertight and intended to carry soil and waste from S.W.R. drainage system to roadside sewers or drains and from there to treatment plant or disposal point. This system is advantageous over traditional drainage products for all drainage and sewerage application and highly recommended for buildings where hygiene is a prerequisite such as hospital, hotels, etc.

ASTRAL Underground® system can also be used for rainwater collection and disposal, including rainwater harvesting. In short, the system provides complete solution for underground drainage and sewerage applications.

Unlike conventional drainage products, there is no fear of pollution of underground water, soil or ill effects on building foundations. The installation of this system is quite simple and fast. The choice of the raw material, the structural accuracy and the strict quality control imparts high degree of reliability.

ASTRAL's Inspection Chambers have been designed to offer easier and more economical alternatives to traditional construction methods. They are made of a tough polypropylene material, are impact resistant, simple and straightforward to install. The chamber raising pieces are designed for simple dry joining, providing an instant watertight joint. They have strengthening ribs and webbing. The raising pieces can be simply built-up to the required overall height between the chamber base and cover. Both ASTRAL® 315 & 450 mm pre-formed units comply with all current regulations. They are designed with a built-in fall for good flow performance.

## FEATURES AND BENEFITS :

**Great Flexibility :** Due to availability of ready made inspection chambers, long lengths of lighter weight pipes and different components, installation of this system is very convenient and fast.

**Perfect Hydraulic Properties :** The chambers are designed with in built slope which increase the hydraulic capabilities of the system.

**Great Strength :** System is sufficiently durable to meet site loading requirements.

**Watertight System :** Pipe, riser or shaft connection with the chamber base is absolutely watertight and unique. Design of pipe joints with click ring and sealing ring makes the system completely leak proof.

**Hygienic and Safe :** Trouble free performance of the joints without blockage and leakage ensures high standards of hygiene.

**Minimum Excavation Cost :** Because of simple joining technique, trench width can be kept minimum and smoother bore of the pipe allow high flow rates at relatively flatter gradients..

**Minimal Maintenance :** Optimum functional qualities and good hydraulic properties play an important part in reducing the need for jetting and other forms of maintenance, and therefore operational costs are considerably reduced.

**Longer Life and Overall Economy :** It is sufficiently durable, and offers long and trouble free service.



**315 MM INSPECTION CHAMBER**

ASTRAL's innovative design for 315 mm, brings unmatched flexibility to the underground drainage market. The joints & seals are designed such that they can accommodate the movement of connecting piece up to 3° in any direction.

This is of great assistance to the installer where the connecting pipes are not perfectly aligned with the chamber inlets. In many instances it will eliminate the need to install an extra bend and provide a saving on the cost of the installation. The chamber base is designed to facilitate the stacking of bases on top of one another to give a space saving storage solution for the merchant stockist. In summary, the Inspection Chamber design and flexibility provides a practical, innovative and cost effective solution for the provision of access in a drainage system.

**ASTRAL® 315 mm chamber to be used with three risers. Depth are as shown in the chart below.**

| 315 mm Chamber   | Height in mm |
|------------------|--------------|
| Only Body        | 240 mm       |
| With One Riser   | 375 mm       |
| With Two Riser   | 510 mm       |
| With Three Riser | 645 mm       |

**450 MM LARGE DIAMETER INSPECTION CHAMBER**

ASTRAL's product innovation is again demonstrated with the introduction of a new 450 mm. diameter large inspection chamber. Significant research and development has gone into the design of this unique product. The Chamber base incorporates 02-160 mm & 02-110 mm inlets with main through of 160 mm. Also 160 mm inlets can be converted to all 110 mm inlets with reducer which allow 3° of movement in any direction. The plastic cover and frame can take loadings up to a maximum of 35kN.

**ASTRAL® 450 mm chamber to be used with four risers. Depth are as shown in the chart below.**

| 450 mm Chamber   | Height in mm |
|------------------|--------------|
| Only Body        | 345 mm       |
| With One Riser   | 575 mm       |
| With Two Riser   | 740 mm       |
| With Three Riser | 905 mm       |
| With Four Riser  | 1065 mm      |

# INSTALLATION – 315 & 450MM CHAMBERS

## INSTALLATION PROCEDURE – 315 & 450MM CHAMBERS

Installation of the chambers is to be done with the standard practice and as requirement of local authorities.

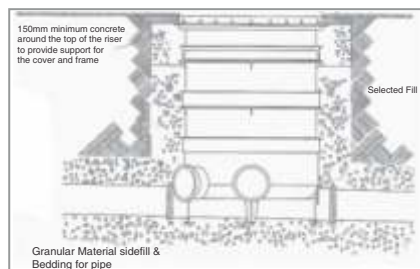
General installation figures are provided herewith for different type of installation mainly based on traffic loads which are going to impose on system. Fig. 1 is for installation of 450mm chamber base with durable polypropylene cover and frame having wheel load up to 3.5 tonnes. Suits pedestrian areas / domestic driveways. Fig. 2 is for installation of 450 mm chamber base with RCC cover and frame having wheel load up to 20 tonnes. Suits heavy traffic loads. Fig. 3 is for installation of 315 mm chamber base.

## GENERAL STEPS FOR INSTALLATION:

- The chamber base should be bedded with suitable granular material or single size aggregates having no sharp edges on 100 mm depth for light traffic load conditions. For heavy traffic load conditions (Fig.1 & Fig.3), the base should be surrounded by concrete as shown in Fig. 2.
- When ASTRAL® PP cover and frame is used, the cover and frame is to be supported on a concrete base while the chamber is surrounded by granular backfill 150mm wide as recommended. When RCC or other cover is used, the chamber should be fully supported in concrete surround.
- Connect the pipes with rubber lubricants as per the standard joining procedure.

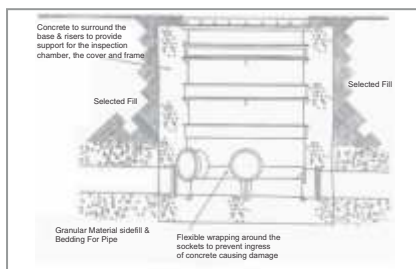
**Figure 1**

*Polypropylene lockable cover & frame 3.5 tonnes wheel load suits pedestrian areas/domestic driveways.*

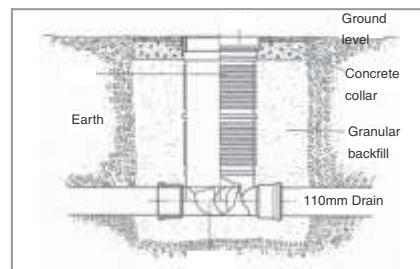


**Figure 2**

*RCC cover & frame for higher wheel loads*



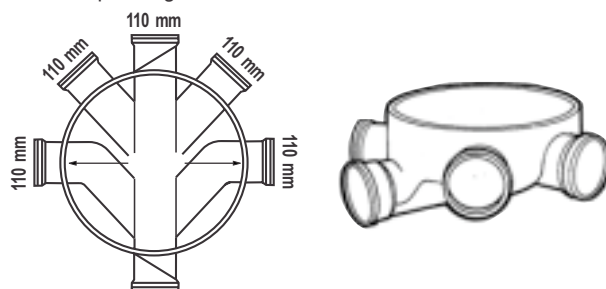
**Figure 3**



### 315 mm Inspection Chamber Installation

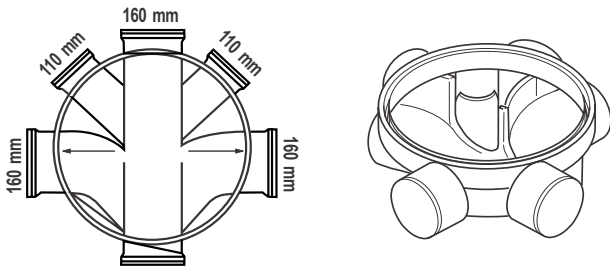


- Base units are supplied with lubricated blanking plugs. These may be pushed out on site when required and used to secure unused inlets.
- When making joints, the pipe spigot must be well chamfered, de-burred, cleaned and lubricated using ASTRAL's lubricant.
- The pipe is then pushed into the socket allowing a clearing for subsequent expansion i.e., pipes should be pushed home fully and then withdrawn by 10 mm.
- Depending on the depth of invert required, use combination of the chamber base and risers. The riser can be cut for the intermediate depth. Use rubber seal ring in between chamber base and riser for 450 chamber and between last riser and cover for 315 mm chamber. For subsequent risers, rubber rings are not required.
- Place the frame and cover to meet the site requirements and depending on the traffic loads.



315 mm Inspection Chamber System

- Backfill the pit with granular material with 150 mm width. Properly compact the backfill material, if needed watering can be used.
- 6" PCC / RCC at the top is recommended for heavy traffic loads. The frame should be properly embedded in these concrete and then the cover should be placed on it.
- If the chamber is to be installed in ground where the water level may rise above the invert level of the chamber, the chamber must be bedded on and surrounded by concrete.
- Precaution must be taken to protect chamber from damage by construction site traffic.
- During backfilling, always place the cover and frame in position to prevent ingress of foreign matter into the drain and excessive deflection of the chamber walls.



450 mm Inspection Chamber System

#### 450 mm Inspection Chamber Installation



#### ASTRAL UNDERGROUND - PRODUCT DETAILS :

| ASTRAL Underground® Chamber | Invert Depth |           | Component     | Size of Inlet(s) Outlet |                 | Material                        | Load Capacity       |
|-----------------------------|--------------|-----------|---------------|-------------------------|-----------------|---------------------------------|---------------------|
|                             | Min. (mm)    | Max. (mm) |               | Main inlet(s) Outlet    | Branch inlet(s) |                                 |                     |
| 315                         | 230          | 600       | Base          | 110                     | 110             | Polypropylene Impact co-polymer |                     |
|                             |              |           | Riser         |                         |                 |                                 |                     |
|                             |              |           | Frame & Cover |                         |                 |                                 |                     |
| 450                         | 340          | 1200      | Base          | 160                     | 02 No. 110 mm   | Polypropylene Impact co-polymer | 1.5 tone wheel load |
|                             |              |           | Riser         |                         |                 |                                 |                     |
|                             |              |           | Frame & Cover |                         |                 |                                 |                     |

Note : These chambers can be used for higher load capacities using RCC covers on top of them. Normally load capacities are applied to covers, not to chambers.





## GULLIES

A gully holds water, like a trap, to stop foul air escaping from the foul drainage system. Its purpose is to accept waste water from ground floor bathrooms, kitchens and utility rooms or rainwater from paved areas or roofs.

### ASTRAL® BOTTLE GULLY

ASTRAL® bottle gullies can be used to remove surface water from paved pedestrian areas. Side and back boss inlets accept waste water from ground floor domestic applications and / or rainwater from roofs.

By adding a raising piece the gully grating can be installed where paving is set at varying heights, where a new surface is laid or if deep bedding is required. It can be cut to the desired length to allow the gully to be installed at depths of up to 600 mm, reducing the need for additional bends.

The Bottle Gully has one 110 mm outlet and three closed inlets for either waste pipe or 110 mm connections. To discharge waste pipes to this gully adapt the smaller closed inlets by drilling them out with a 48 mm hole cutter and use the correct adaptor for the boss to accept the 32 mm, 40 mm and 50 mm waste pipe.

- Ideal for domestic, industrial and commercial installations.
- Accepts waste or rainwater pipework from 32 mm up to 110 mm sizes
- Includes sealed rodding access
- **Size Available : 160 mm x 110 mm**





The surface channel that are used at present are of cast iron or in concrete and due to their heavy weight it is difficult to handle or storage or to install and more over they are prone to corrosion.

ASTRAL® offers surface channel made from polypropylene and they are free from above problems caused by traditional surface channel.

**SALIENT FEATURE:**

- Tough and durable
- Excellent corrosion and chemical resistance
- Environment friendly • Light weight
- Easy to install • Cost effective.
- Saves labour and material cost
- Effective substitute to C.I and concrete channels.
- Durable design resists up to 1 tonne wheel load

**AVAILABLE SIZES :** 110 mm x 1 mtr Long End.  
 LH & RH both end caps are available.

**LH END CAP**



**RH END CAP**



**COVER TEE**



**FIELD OF APPLICATION :**

In various applications like pavements, road side curbs, cycle ways and car park area, shopping malls, sports grounds, building terrace, corporate houses, hotels, hospitals, academic institutes and many more places where surface drain is necessary.

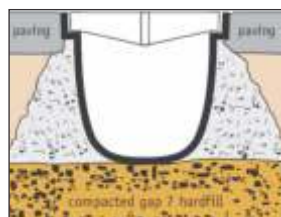
**INSTALLATION GUIDELINE :**



Sufficient slope in the paving and channel should always be determined prior to installation to accommodate desired water run-off.  
 Place channel in trench



Engage all modules including bends before backfilling



Always backfill with concrete with the grating fitted Haunch concrete up and around channel without leaving any empty spaces



Simple push-together channel system for ease of installation.



# FOAMCORE PIPES



IS 16098: 1  
 **1<sup>st</sup>**  
 in India  
CM/L-2912861



### AVAILABLE SIZES

- 110 mm, 160 mm, 200 mm, 250 mm & 315 mm with stiffness class SN 2, SN 4, and SN 8.

### ASTRAL FOAMCORE® PIPES

"Foamcore" uPVC pipes are suitable for residential and commercial drain, waste & vent piping systems for both underground and above ground applications with top quality raw materials and state-of-the art processing technology, ASTRAL Foamcore® pipes meet all industrial standards in addition to our own rigorous quality control standards.

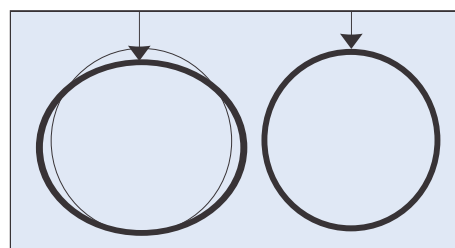
### UNIQUE FEATURES AND BENEFITS :

- Light Weight & Strong
- Wide Range & Compatibility
- Easy To Install
- Longer Service Life
- Reduction In Noise Level
- Cost Saving

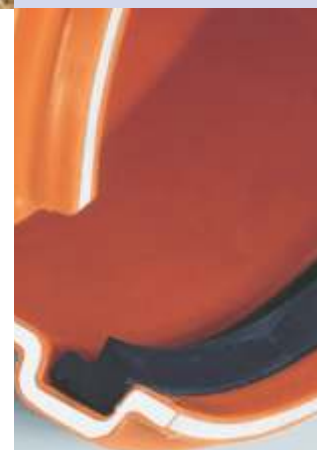
Apart from above mentioned unique features and benefits, ASTRAL Foamcore® pipes have conventional benefits of PVC pipes like chemical and corrosion resistance, non-toxicity, non conductor, non flammable and environmental friendliness.

### WHY FOAMCORE PIPES ?

The pipe shown below on the left is typical of solid wall PVC under load and the type of distortion normally expected. The Foamcore pipe on the right, under equal load, distributes the load more evenly and does not show the same amount of distortion, as it has unique "I-Beam" structure. Due to its ability of absorbing the load, Foamcore pipes are most suitable for underground drainage systems, where soil exerts a lot of pressure on pipe surfaces. In solid wall pipes this soil pressure will rupture the pipe after some time where Foamcore pipes give better life as foamed PVC layer will absorb pressure and make pipes "Stress Free" in working conditions.



*Solid Wall PVC Pipe      Foamcore PVC Pipe*



### PRODUCT STANDARDS

ASTRAL Foamcore® pipes are manufactured as per European and International standards published under structure wall pipes for drainage and sewerage and are mainly based on stiffness classes.

These specifications are very well adopted at global levels and are in used for more than 25 years.

## SPECIALLY DEVELOPED FITTINGS

### ADJUSTABLE BEND :

Adjustable Bends are specially designed by ASTRAL® to suit with installation of inspection chambers. As the chamber inlet and outlets have fixed angle & position, adjustable bends can be changed depend on site requires. These bends are available in two different patterns one with 02 pcs (suitable for 5° to 37.5° movement) & 03 pcs (suitable for 0° to 87.5° movement). These bends eliminates use of extra fittings and pipes to get the angle with pipeline and hence very cost effective. Also it is durable, leakage free and very easy to install at any angle.

### LONG RADIUS REST BEND :

This is specially designed to take the load of vertical shaft and the sudden impact of drain & sewer falling down from the vertical lines. The rib on the curve area will strengthen the bend and give adequate support to act as counter force against load due to falling sewer & drain.

### ACCESS AND RODDING POINTS :

Access is very important on all installations for testing, inspection, and removal of any blockage or debris. Rodding in both directions can be achieved by using a 315 mm or 450 mm Large Inspection Chamber in conjunction with access fittings. Rodding points are more usually used in storm water drainage systems where the rodding point is located at the head of the drain run connection to a chamber, and being no further than 22 meters away from the chamber. The rodding point should be enclosed in a concrete surround to provide support and to ensure that it does not become mislaid at ground level.

Rodding points eliminates the need for majority of conventional manholes. By using various combinations of rodding point with ASTRAL's other standard range of fittings, considerable savings can be achieved on cost of underground drainage system.



2 Pc Adjustable Bend



3 Pc Adjustable Bend



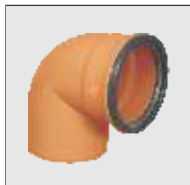
Long Radius Bend



Access and Rodding Points.

## STANDARD FITTINGS

### ASTRAL UNDERGROUND® MOLDED FITTINGS



Bend 87.5°



Coupler



Single Tee



Single "Y"



Bend 45°



Blanking Plug



Swept Tee



Swept Tee With Door

### ASTRAL UNDERGROUND® FABRICATED FITTINGS



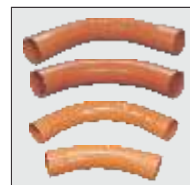
Equal Tee



Reducer Tee



Coupler



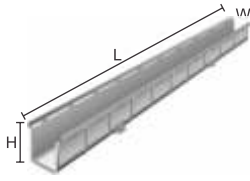
Long Radius Bend



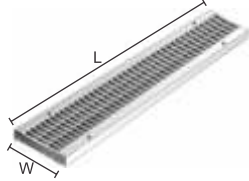
End Cap

\*Other Molded / Fabricated fittings are available on request.

**NEW ARRIVALS IN  
SURFACE CHANNELS**



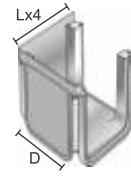
| CSA100 |     | PVC CHANNEL |  |
|--------|-----|-------------|--|
| L      | W   | H           |  |
| 1000   | 100 | 100         |  |



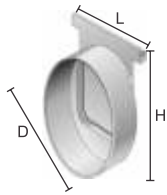
| SGR100G |     | PVC GRID |  |
|---------|-----|----------|--|
| L       | W   |          |  |
| 500     | 100 |          |  |



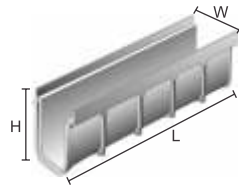
| GSZ10999 |     | GALVANIZED GRID A15 |  |
|----------|-----|---------------------|--|
| L        | W   |                     |  |
| 1000     | 100 |                     |  |



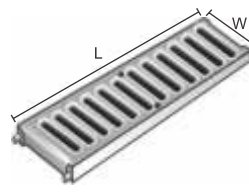
| RAC100 |       | FOUR WAY UNION FOR CHANNEL |  |
|--------|-------|----------------------------|--|
| Lx4    | D     |                            |  |
| 100    | 40-80 |                            |  |



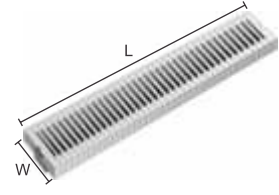
| TCA100 |     |     | END SOCKET PRATIKO |  |
|--------|-----|-----|--------------------|--|
| L      | H   | D   |                    |  |
| 100    | 130 | 110 |                    |  |



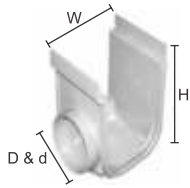
| CSA130 |     | PVC CHANNEL |  |
|--------|-----|-------------|--|
| L      | W   | H           |  |
| 500    | 130 | 150         |  |



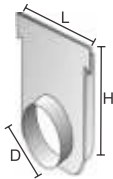
| CGRN130G |     | PVC REINFORCED GRID |  |
|----------|-----|---------------------|--|
| L        | W   |                     |  |
| 500      | 130 |                     |  |



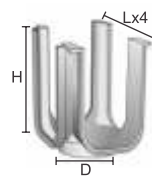
| MG13999G |     | MULTIGRIL GRID |  |
|----------|-----|----------------|--|
| L        | W   |                |  |
| 1000     | 130 |                |  |



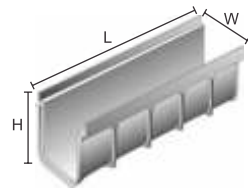
| CAGS130 |     | OUTLET SOCKET PRATIKO |       |
|---------|-----|-----------------------|-------|
| W       | H   | D x 3                 | d x 3 |
| 130     | 170 | 80                    | 75    |



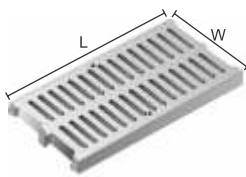
| TCA131 |     |     | END SOCKET PRATIKO |  |
|--------|-----|-----|--------------------|--|
| L      | D   | H   |                    |  |
| 130    | 130 | 145 |                    |  |



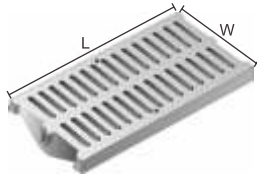
| RCA130 |     |        | FOUR WAY UNION FOR HIGH CHANNEL |  |
|--------|-----|--------|---------------------------------|--|
| L x 4  | H   | D      |                                 |  |
| 130    | 145 | 90-110 |                                 |  |



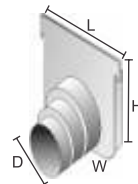
| CSA200 |     |     | PVC DRAINAGE CHANNEL |  |
|--------|-----|-----|----------------------|--|
| L      | W   | H   |                      |  |
| 500    | 200 | 175 |                      |  |



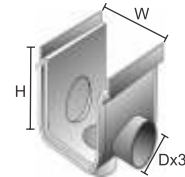
| CGRN20LG |     | LIGHT PVC GRID |  |
|----------|-----|----------------|--|
| L        | W   |                |  |
| 500      | 200 |                |  |



| CGRN20SG |     | REINFORCED PVC GRID |  |
|----------|-----|---------------------|--|
| L        | W   |                     |  |
| 500      | 200 |                     |  |



| TCA200 |             |     |     | END SOCKET PRATIKO |  |
|--------|-------------|-----|-----|--------------------|--|
| L      | D           | W   | H   |                    |  |
| 200    | 100-110-125 | 115 | 180 |                    |  |



| CAGS200 |     |       | OUTLET SOCKET PRATIKO |  |
|---------|-----|-------|-----------------------|--|
| W       | H   | D x 3 |                       |  |
| 200     | 200 | 125   |                       |  |



| PCF1090G |     |    | SLOTTED GRID PVC A15 |  |
|----------|-----|----|----------------------|--|
| L        | W   | H  |                      |  |
| 500      | 100 | 90 |                      |  |



| PCF1014G |     |     | SLOTTED GRID PVC B125 |  |
|----------|-----|-----|-----------------------|--|
| L        | W   | H   |                       |  |
| 500      | 100 | 140 |                       |  |

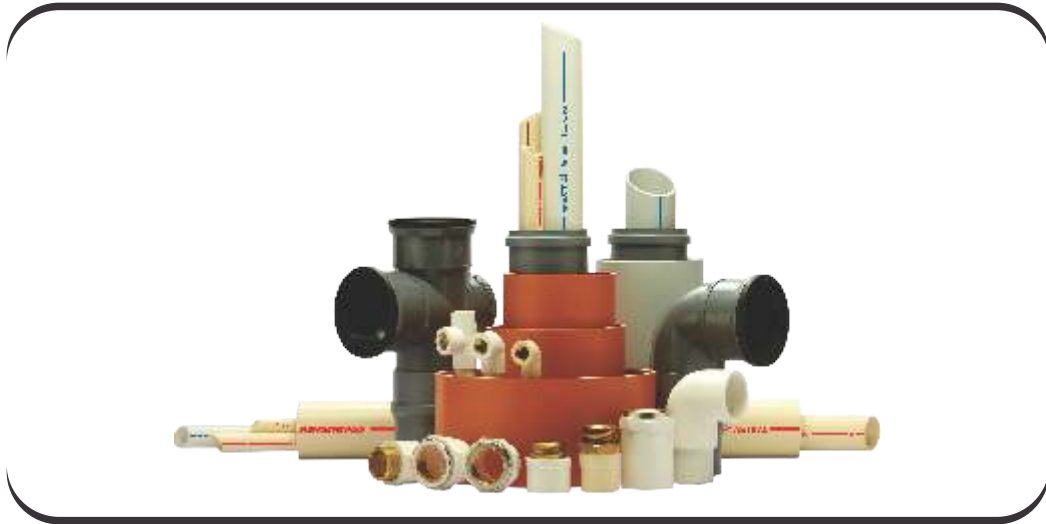


| PCF1390G |     |    | PVC SLOTTED GRID |  |
|----------|-----|----|------------------|--|
| L        | W   | H  |                  |  |
| 500      | 130 | 90 |                  |  |



| PCF1314G |     |     | PVC SLOTTED GRID |  |
|----------|-----|-----|------------------|--|
| L        | W   | H   |                  |  |
| 500      | 130 | 140 |                  |  |





## OTHER PIPING SYSTEMS

- | ASTM UPVC PIPING SYSTEM | uPVC DRAIN WASTE & VENT SYSTEM | LIGHT WEIGHT FOAMCORE UPVC PIPES |
- | CPVC PIPING SYSTEM FOR INDUSTRIES | WIRE GUARD CONDUIT PIPES & FITINGS | ALCA PLAST SHOWER CHANNELS |
- | CPVC PIPING SYSTEM FOR FIRE SPRINKLERS | CPVC-AL-CPVC MULTILAYER COMPOSITE PIPE |
- | CPVC PLUMBING SYSTEM FOR HOT & COLD WATER | THE LEADING SOUNDPROOF SOIL & WASTE SYSTEM |
- | CLAMPS, HANGERS AND ELECTRICAL FLUSH BOXES | uPVC PIPE FOR AGRICULTURE & WATER TRANSPORT SYSTEM |
- | uPVC CONVENTIONAL SYSTEM FOR SOIL WASTE & RAIN WATER |
- | HEAVY METAL & LEAD FREE COLUMN PIPES FOR SUBMERSIBLE PUMP |

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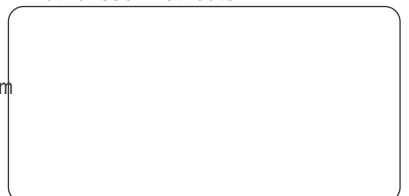
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