



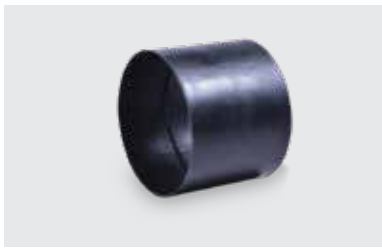
INFRA  
DIVISION

# D-Rex

DOUBLE WALLED CORRUGATED  
UNDERGROUND DRAINAGE  
AND SEWERAGE SYSTEM



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IN INDIA**

**1<sup>st</sup> TO  
INTRODUCE  
LOW NOISE  
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PIPES IN INDIA**

**1<sup>st</sup> TO  
INTRODUCE  
FOAMED PVC  
DRAINAGE  
PIPES IN INDIA**



**1<sup>st</sup> TO  
INTRODUCE  
LEAD FREE  
COLUMN PIPES  
IN INDIA**

**1<sup>st</sup> TO  
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POLYMER BASED  
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PIPING SYSTEM  
IN INDIA**

**1<sup>st</sup> TO  
INTRODUCE  
NSF APPROVED  
SOLVENT  
CEMENT  
IN INDIA**

**1<sup>st</sup> TO  
INTRODUCE  
CPVC PIPING FOR  
AUTOMATIC  
FIRE SPRINKLER  
SYSTEM IN INDIA**

# ASTRAL, INDIA'S PROGRESSIVE BUILDING MATERIALS 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, Sangli & Aurangabad in Maharashtra, and Sitarganj in Uttarakhand 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 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.

In the year 2020, Astral has expanded its product portfolio and entered into the Water Tanks Segment. The water tank segment is an expanded domain of plumbing and water supply with a huge nationwide potential. Astral Pipes manufactures water tanks from its Santej & Aurangabad manufacturing facilities. The new addition in the product offering will help Astral author a next chapter of success and will establish it as a prominent player in building materials industry.

## ADHESIVES

EPOXY ADHESIVES & PUTTY  
SILICONE SEALANTS  
CONSTRUCTION CHEMICALS **PVA**  
CYANOACRYLATE **SOLVENT CEMENTS**  
**TAPES** POLYMERIC FILLING COMPOUND  
ANAEROBIC ADHESIVES  
INDUSTRIAL ADHESIVES  
**INSTANT HAND SANITIZER**  
SURFACE CLEANING PRODUCTS

## PIPING

PLUMBING PIPES & FITTINGS  
**CPVC, PVC & PEX**  
SEWERAGE DRAINAGE PIPES & FITTINGS  
**AGRICULTURE** PIPES & FITTINGS  
**INDUSTRIAL PIPES & FITTINGS**  
FIRE SPRINKLERS PIPES & FITTINGS  
**CONDUIT & CABLE** PROTECTION  
ANCILLARY PRODUCTS  
**URBAN** INFRASTRUCTURE  
**DUCTING**





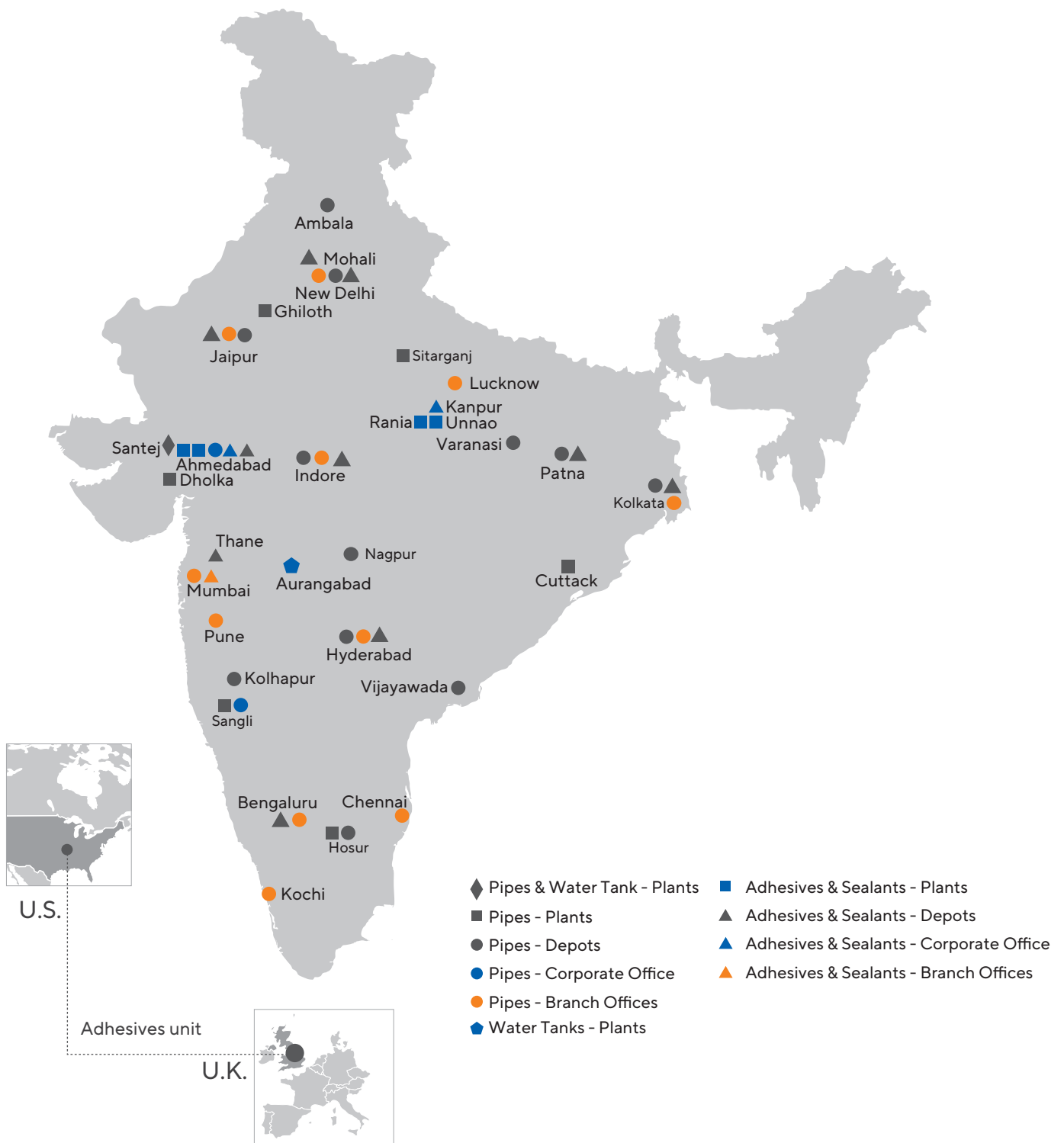
# INNOVATION & RECOGNITIONS

- 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, 2020 & 2022)
- 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, 2021 & 2022)



# 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 Vijaywada, Hyderabad, Delhi, Kolhapur, Kolkata, Nagpur, Indore, Patna, 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** **D-Rex**

Astral D-Rex is an innovative product described as structured wall piping system of PE/PP with smooth internal and corrugated (profiled) external surface. The corrugated (profiled) external surface of the D-Rex pipes gives the product excellent ring stiffness (load bearing capacity). Unlike plain pipes, D-Rex pipes do not deform under vehicular traffic load. Furthermore, since these pipes are moderately flexible, they can be aligned comfortably even in gradually bending paths.

The inner wall, which is fused with the outer wall, is smooth and facilitates laminar flow of liquids/slurry. This results in lesser possibilities of pipe clogging, deposition of debris in the pipe path, etc.

D-Rex stands high as compared to the conventional options owing to its advantages and cost-economic viability, and is a popular product among the end users and contractors.



# STANDARDS & SPECIFICATIONS

IS: 16098 (Part-2)

Structured-Wall Plastics Piping Systems for non-pressure drainage and sewerage –specification

Part-2: Pipes and fittings with non-smooth external surface, Type B

ISO: 21138 (Part-3)

Plastics piping systems for non-pressure underground drainage and sewerage – Structured-wall piping systems of unplasticized poly(vinyl chloride) (PVC-U), Polypropylene (PP) and Polyethylene (PE) – Part 3: Pipes and fittings with non-smooth external surface, Type B

BS EN 13476 (Part-3)

Plastics piping systems for non-pressure underground drainage and sewerage. Structured-wall piping systems of unplasticized poly(vinyl chloride) (PVC-U), Polypropylene (PP) and Polyethylene (PE). Specifications for pipes and fittings with smooth internal and profiled external surface and the system, Type B

IS: 16098 (Part-2)



Only those products bearing the above marks are certified



ISI CERTIFICATE



ISO 14001 & 45001  
IMS CERTIFICATE



ISO 9001  
QMS CERTIFICATE

# WHY ASTRAL D-REX

## INTRODUCED D-REX FOR THE FIRST TIME IN INDIA

Astral has played a key role in introduction of a variety of new products in the Indian Piping Industry with the sole motive of encouraging the application of superior user friendly and economic solutions. Introduction of Double Wall Corrugated (DWC) pipes in Indian Market is one of the examples of Astral pipes' vision towards product innovation.

## HIGHEST NUMBER OF APPROVALS

D-Rex is approved by most of the Government and Private organisation for Sewerage application.

## STATE OF THE ART MANUFACTURING

Astral is equipped with state of art manufacturing facilities at Sangli, Sitragunj and Ghiloth plants specifically for D-Rex DWC Pipes. High speed and accurate extruders and injection moulding machines including innovative manufacturing techniques being used to manufacture the ultra modern, errorless Astral D-Rex pipes and fittings. The manufacturing systems installed at Astral are extremely advanced and based on state-of-the-art German equipment and extrusion process technology.



## TOTAL BACKWARD INTEGRATION

All of Astral's DWC Pipes and Fittings are made from PE/PP which is manufactured and controlled by Astral at every stage of the process. Also German corrugation technology provides highest stiffness to products. This backward integration helps us consistently maintain the highest quality for all pipes and fittings.



## WIDEST PRODUCT RANGE

Astral has wide variety of sizes ranging from 75 mm to 800 mm diameter, SN 4 & SN 8 stiffness classes. Hence you can meet any requirement with this widest range of DWC pipes.

## SKILL DEVELOPMENT & TRAINING PROGRAMME FOR INSTALLERS

Astral provides training to persons who install DWC pipes and fittings throughout the year by updating them about modern installation techniques and how to make installations more effectively and professionally.

# DIMENSION & SIZES

Mean inside Diameter: The mean inside diameter, at any point and tolerances shall be as given in Table 5 of IS: 16098 (Part-2) and shall be measured according to the method given in IS: 12235 (Part-1).

Wall Thickness: The nominal wall thickness, e4, e5, shall be in accordance with Table 5 of IS: 16098 (Part-2). Tolerances in inside diameters shall be those given in IS: 16098 (Part-2).

Length of pipe: Effective length of pipes (l) without sockets shall be not less than that specified by the manufacturer when measured as shown Figure. 1 of IS: 16098 (Part- 2). The lengths may be supplied as agreed to between the purchaser and the manufacturer.

## PIPES NOMINAL SIZE DN ID (MM)

75, 100, 135, 150, 170, 200, 250, 300, 400, 500, 600, 800

## STANDARD LENGTH

3 M & 6 M straight pipes

## PIPE END

Plain End & In-Line Socketed End

### FITTINGS



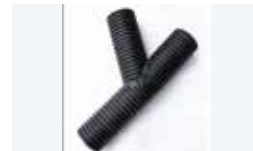
Long Bend



Fabricated Tee



Fabricated Cross



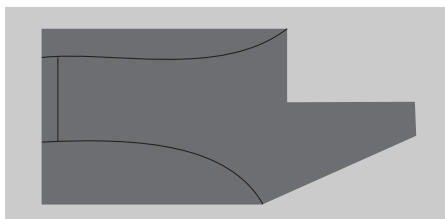
Fabricated Y

## COLOUR CODE

SN 4 - Outside wall Black and Inside wall White

SN 8 - Outside wall Black and Inside wall Orange

### RUBBER RING



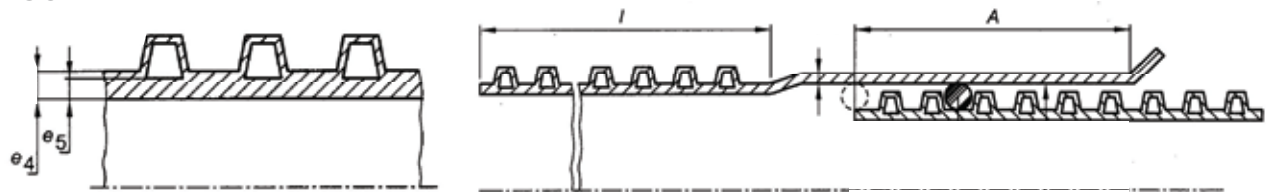
- Specially designed flap type rubber ring
- Manufactured as per IS 5382, material- EPDM
- Profile specific design of rubber ring to ensure leak-proof joint
- Allows easy entry for spigot into socket
- Provides resistance to reverse movement of spigot from socket

TABLE - 5

Nominal Inside Diameter (mm)	Min. Wall Thickness (mm)		Socket length A (min) (mm)
	e <sub>4</sub>	e <sub>5</sub>	
75	1.0	0.85	27
100	1.0	1.0	32
135	1.2	1.0	39
150	1.3	1.0	43
170	1.4	1.0	48
200	1.5	1.1	54
250	1.8	1.5	59
300	2.0	1.7	64
400	2.5	2.3	74
500	3.0	3.0	85
600	3.5	3.5	96
800	4.5	4.5	118

Pipe Stiffness Classes: SN 4 (4 kN/m<sup>2</sup>) & SN 8 (8 kN/m<sup>2</sup>)

FIGURE - 1



# SALIENT FEATURES



Excellent Load Bearing Capacity



Abrasion resistant



Low Manning's Roughness Coefficient 'n' - 0.009  
(Lower the Manning's Roughness coefficient, lower is resistance to flow, resulting into higher flow)



Flexible and Fatigue Resistant



High Hazen William's Coefficient 'C' - 150  
(Higher the Hazen William's coefficient, higher will be flow)



Excellent Anti-Corrosive Properties



Chemically Inert



Suitable for aggressive climatic conditions



Gives excellent soil bonding

# KEY PROPERTIES



## GREAT FLEXIBILITY

Being light in weight and elastic in nature, these pipes offer lot of flexibility while installation as they are adaptable to any type of contour patterns.



## EXCELLENT CHEMICAL, CORROSION AND ABRASION RESISTANCE

Due to PE/ PP material these pipes are free from corrosion and offer excellent resistance to wide range of chemicals. These pipes have excellent abrasion resistance which gives an edge over metal and concrete pipes.



## EXCELLENT STIFFNESS

Suitable to withstand heavy overload pressure (soil and traffic loads) and sustain various loads that will encounter during installation and in use.



## WATERTIGHT JOINTS

Joints are 100% watertight and hence free from any infiltration, ex-filtration and root penetration. Due to this feature, surroundings remain unaffected and possibility of soil or underground water pollution is eliminated.



## PERFECT HYDRAULIC PROPERTIES

Glass smooth inner surface having manning's coefficient 0.009 - 0.010 (which remain constant without any deterioration during life expectancy) helps in rapid disposal of flowing waste. Such smooth surface greatly reduces the possibility of blockages and maximizes the flow characteristics and therefore carrying capacity increases by 40% over concrete pipes.



## EASY AND QUICK INSTALLATION

Due to longer lengths and lighter weight pipes, installation becomes very convenient and fast. These pipes are very easy to join using slip-on techniques (Pipes are supplied either with integrally welded couplers or separate couplers). Unlike conventional concrete or metallic pipes, these pipes do not require any heavy handling equipment for installation due to their lightweight property. These pipes can be easily laid in constrained areas thereby saving additional extraneous costs.



## MAINTENANCE FREE

Being free from scaling, encrustation and chemical re-activeness there is no need of any regular maintenance. Occasional flushing with water keeps the surface smooth and helps in enhancing the functionality.



## COST EFFECTIVE

60 to 70% weight saving in comparison to solid wall plastic pipes and 95% lighter than concrete pipes makes these pipes much cost effective.



## LONG LIFE

Being free from corrosion and chemical reactiveness as well as due to excellent abrasion resistance these pipes can last over a century.



## ECO-FRIENDLY

Processing and reprocessing of these pipes does not have any adverse impact on the environment, watertight joints eliminates the possibility of soil and underground water pollution.



## RODENT REPELLENT

The Rodents develop a distinct disliking for biting the pipes which contain Rodent Repellent additives, as compared to the pipes without Rodent Repellent additives.

# FIELDS OF APPLICATIONS

- Sewerage and Drainage
- Collectors for Sub-Surface Drainage
- Culvert and Highway Drainage
- Effluent / Wastewater Transport Network
- Rainwater Collection Network
- Storm water Drainage Network



# TECHNICAL DETAILS

## WHAT IS SN CLASS?

SN Stands for Nominal Ring Stiffness.

It represents the Ring stiffness of a flexible pipe and indicates the pipes ability to resist

Traffic Load as well as Soil Load against proposed depth

$$S_c = (0.0186 + 0.025 y_c/d) F_c/L_c y_c$$

[  $F_c$  = Force corresponding to 3 % pipe deflection (KN) •  $L_c$  = Length of test piece (M) •  $y_c$  = Deflection (M) ]

## BASIC SELECTION OF SN CLASS OF PIPE

The selection of SN class of Pipe depends upon major two factors i.e. Burial depth (Cover height) and type of Traffic load on site.

BURIAL DEPTH	TRAFFIC LOAD		
	LOW	MEDIUM	HIGH
Low	SN 4	SN 8	SN 16
Medium	SN 4	SN 8	SN 16
High	SN 8	SN 8	SN 8

## DISCHARGE CALCULATION

$$Q = A \times R \times S/n$$

$$Q = \text{Discharge (m}^3/\text{s)}$$

$$A = \text{Cross sectional flow area of pipe (m}^2) = \pi/4 \times ID^2$$

$$R = \text{Hydraulic radius (m) for pipe full flow, } R = (ID/4)^{3/2}$$

$$S = \text{Pipe slope (m/m) = 1\% = (0.01)}^{1/2}$$

$$n = \text{Manning coefficient} = 0.009$$

PIPE ID (mm)	ID (m)	A (m <sup>2</sup> )	R (m)	S (m/m)	Q (m <sup>3</sup> /s)
75	0.075	0.00442	0.07058	0.1	0.003464
100	0.100	0.00785	0.0855	0.1	0.007461
135	0.135	0.01431	0.10444	0.1	0.01661
150	0.150	0.01767	0.11204	0.1	0.021998
170	0.170	0.0227	0.12178	0.1	0.030714
200	0.200	0.03142	0.13572	0.1	0.047376
250	0.250	0.04909	0.15749	0.1	0.085898
300	0.300	0.07069	0.17784	0.1	0.139679
400	0.400	0.12566	0.21544	0.1	0.300816
500	0.500	0.19635	0.25000	0.1	0.545415
600	0.600	0.28274	0.28231	0.1	0.886906
800	0.800	0.50265	0.342	0.1	1.910061



# PRODUCT



# RANGE

# D-REX DOUBLE WALL CORRUGATED (PROFILED) PIPE



**DOUBLE WALL  
CORRUGATED  
PLAIN PIPE  
(ONE COUPLER WITH  
TWO RUBBER RINGS)**

**HSN CODE: 39172190**

Size (cm)	Size (mm)	Length (m)	Stiffness Class	Product Code
7.5	75	3	SN4	A214075C0003C
10.0	100	3	SN4	A214100C0003C
13.5	135	3	SN4	A214135C0003C
15.0	150	3	SN4	A214150C0003C
17.0	170	3	SN4	A214170C0003C
20.0	200	3	SN4	A214200C0003C
25.0	250	3	SN4	A214250C0003C
30.0	300	3	SN4	A214300C0003C
40.0	400	3	SN4	A214400C0003C
50.0	500	3	SN4	A214500C0003C
60.0	600	3	SN4	A214600C0003C
80.0	800	3	SN4	A214800C0003C



**DOUBLE WALL  
CORRUGATED  
PLAIN PIPE  
(ONE COUPLER WITH  
TWO RUBBER RINGS)**

**HSN CODE: 39172190**

Size (cm)	Size (mm)	Length (m)	Stiffness Class	Product Code
7.5	75	6	SN4	A214075C0006C
10.0	100	6	SN4	A214100C0006C
13.5	135	6	SN4	A214135C0006C
15.0	150	6	SN4	A214150C0006C
17.0	170	6	SN4	A214170C0006C
20.0	200	6	SN4	A214200C0006C
25.0	250	6	SN4	A214250C0006C
30.0	300	6	SN4	A214300C0006C
40.0	400	6	SN4	A214400C0006C
50.0	500	6	SN4	A214500C0006C
60.0	600	6	SN4	A214600C0006C
80.0	800	6	SN4	A214800C0006C



**DOUBLE WALL  
CORRUGATED  
WITH IN-LINE  
SOCKETED PIPE  
(WITH RUBBER RING)**

**HSN CODE: 39172190**

Size (cm)	Size (mm)	Length (m)	Stiffness Class	Product Code
10.0	100	3	SN4	A214100S0003C
15.0	150	3	SN4	A214150S0003C
17.0	170	3	SN4	A214170S0003C
20.0	200	3	SN4	A214200S0003C
25.0	250	3	SN4	A214250S0003C
30.0	300	3	SN4	A214300S0003C
40.0	400	3	SN4	A214400S0003C
50.0	500	3	SN4	A214500S0003C
60.0	600	3	SN4	A214600S0003C
80.0	800	3	SN4	M214800S0003C



**DOUBLE WALL  
CORRUGATED  
WITH IN-LINE  
SOCKETED PIPE  
(WITH RUBBER RING)**

**HSN CODE: 39172190**

Size (cm)	Size (mm)	Length (m)	Stiffness Class	Product Code
10.0	100	6	SN4	A214100S0006C
15.0	150	6	SN4	A214150S0006C
17.0	170	6	SN4	A214170S0006C
20.0	200	6	SN4	A214200S0006C
25.0	250	6	SN4	A214250S0006C
30.0	300	6	SN4	A214300S0006C
40.0	400	6	SN4	A214400S0006C
50.0	500	6	SN4	A214500S0006C
60.0	600	6	SN4	A214600S0006C
80.0	800	6	SN4	A214800S0006C

Note:  
1. Sizes which are not produced at Ghiloth Plant (800) are 75, 100, 135 & 800mm ID (both plain pipe & in-line socket).  
2. Sizes which are not produced at Sitarganj Plant (1902) are 400, 500, 600 & 800mm ID (both plain pipe & in-line socket).  
3. Sizes which are not produced at Sangli Plant (1901) with in-line socket are 75, 100 & 135mm ID.



**DOUBLE WALL  
CORRUGATED  
PLAIN PIPE  
(ONE COUPLER WITH  
TWO RUBBER RINGS)**

**HSN CODE: 39172190**

Size (cm)	Size (mm)	Length (m)	Stiffness Class	Product Code
7.5	75	3	SN8	A215075C0003B
10.0	100	3	SN8	A215100C0003B
13.5	135	3	SN8	A215135C0003B
15.0	150	3	SN8	A215150C0003B
17.0	170	3	SN8	A215170C0003B
20.0	200	3	SN8	A215200C0003B
25.0	250	3	SN8	A215250C0003B
30.0	300	3	SN8	A215300C0003B
40.0	400	3	SN8	A215400C0003B
50.0	500	3	SN8	A215500C0003B
60.0	600	3	SN8	A215600C0003B
80.0	800	3	SN8	A215800C0003B



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Size (cm)	Size (mm)	Length (m)	Stiffness Class	Product Code
7.5	75	6	SN8	A215075C0006B
10.0	100	6	SN8	A215100C0006B
13.5	135	6	SN8	A215135C0006B
15.0	150	6	SN8	A215150C0006B
17.0	170	6	SN8	A215170C0006B
20.0	200	6	SN8	A215200C0006B
25.0	250	6	SN8	A215250C0006B
30.0	300	6	SN8	A215300C0006B
40.0	400	6	SN8	A215400C0006B
50.0	500	6	SN8	A215500C0006B
60.0	600	6	SN8	A215600C0006B
80.0	800	6	SN8	A215800C0006B



**DOUBLE WALL  
CORRUGATED  
WITH IN-LINE  
SOCKETED PIPE  
(WITH RUBBER RING)**

**HSN CODE: 39172190**

Size (cm)	Size (mm)	Length (m)	Stiffness Class	Product Code
10.0	100	3	SN8	A214200S0003C
15.0	150	3	SN8	A215150S0003B
17.0	170	3	SN8	A215170S0003B
20.0	200	3	SN8	A215200S0003B
25.0	250	3	SN8	A215250S0003B
30.0	300	3	SN8	A215300S0003B
40.0	400	3	SN8	A215400S0003B
50.0	500	3	SN8	A215500S0003B
60.0	600	3	SN8	A215600S0003B
80.0	800	3	SN8	A215800S0003B



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CORRUGATED  
WITH IN-LINE  
SOCKETED PIPE  
(WITH RUBBER RING)**

**HSN CODE: 39172190**

Size (cm)	Size (mm)	Length (m)	Stiffness Class	Product Code
10.0	100	6	SN8	A215100S0006B
15.0	150	6	SN8	A215150S0006B
17.0	170	6	SN8	A215170S0006B
20.0	200	6	SN8	A215200S0006B
25.0	250	6	SN8	A215250S0006B
30.0	300	6	SN8	A215300S0006B
40.0	400	6	SN8	A215400S0006B
50.0	500	6	SN8	A215500S0006B
60.0	600	6	SN8	A215600S0006B
80.0	800	6	SN8	A215800S0006B

Note:  
1. Sizes which are not produced at Ghiloth Plant (1800) are 75, 100, 135 & 800mm ID (both plain pipe & in-line socket).  
2. Sizes which are not produced at Sitaraganj Plant (1902) are 400, 500, 600 & 800mm ID (both plain pipe & in-line socket).  
3. Sizes which are not produced at Sangli Plant (1901) with in-line socket are 75, 100 & 135mm ID.

# D-REX DOUBLE WALL CORRUGATED (PROFILED) PIPE



**DOUBLE WALL  
CORRUGATED  
PLAIN PIPE WITH  
RODENT REPELLENT  
(ONE COUPLER WITH TWO  
RUBBER RINGS)**

**HSN CODE: 39172190**

Size (cm)	Size (mm)	Length (m)	Stiffness Class	Product Code
7.5	75	3	SN4	A218075C0003C
10.0	100	3	SN4	A218100C0003C
13.5	135	3	SN4	A218135C0003C
15.0	150	3	SN4	A218150C0003C
17.0	170	3	SN4	A218170C0003C
20.0	200	3	SN4	A218200C0003C
25.0	250	3	SN4	A218250C0003C
30.0	300	3	SN4	A218300C0003C
40.0	400	3	SN4	A218400C0003C
50.0	500	3	SN4	A218500C0003C
60.0	600	3	SN4	A218600C0003C
80.0	800	3	SN4	A218800C0003C



**DOUBLE WALL  
CORRUGATED  
PLAIN PIPE WITH  
RODENT REPELLENT  
(ONE COUPLER WITH TWO  
RUBBER RINGS)**

**HSN CODE: 39172190**

Size (cm)	Size (mm)	Length (m)	Stiffness Class	Product Code
7.5	75	6	SN4	A218075C0006C
10.0	100	6	SN4	A218100C0006C
13.5	135	6	SN4	A218135C0006C
15.0	150	6	SN4	A218150C0006C
17.0	170	6	SN4	A218170C0006C
20.0	200	6	SN4	A218200C0006C
25.0	250	6	SN4	A218250C0006C
30.0	300	6	SN4	A218300C0006C
40.0	400	6	SN4	A218400C0006C
50.0	500	6	SN4	A218500C0006C
60.0	600	6	SN4	A218600C0006C
80.0	800	6	SN4	A218800C0006C



**DOUBLE WALL  
CORRUGATED  
WITH IN-LINE  
SOCKETED PIPE  
RODENT REPELLENT  
(WITH RUBBER RING)**

**HSN CODE: 39172190**

Size (cm)	Size (mm)	Length (m)	Stiffness Class	Product Code
10.0	100	3	SN4	A218100S0003C
15.0	150	3	SN4	A218150S0003C
17.0	170	3	SN4	A218170S0003C
20.0	200	3	SN4	A218200S0003C
25.0	250	3	SN4	A218250S0003C
30.0	300	3	SN4	A218300S0003C
40.0	400	3	SN4	A218400S0003C
50.0	500	3	SN4	A218500S0003C
60.0	600	3	SN4	A218600S0003C
80.0	800	3	SN4	A218800S0003C



**DOUBLE WALL  
CORRUGATED  
WITH IN-LINE  
SOCKETED PIPE  
RODENT REPELLENT  
(WITH RUBBER RING)**

**HSN CODE: 39172190**

Size (cm)	Size (mm)	Length (m)	Stiffness Class	Product Code
10.0	100	6	SN4	A218100S0006C
15.0	150	6	SN4	A218150S0006C
17.0	170	6	SN4	A218170S0006C
20.0	200	6	SN4	A218200S0006C
25.0	250	6	SN4	A218250S0006C
30.0	300	6	SN4	A218300S0006C
40.0	400	6	SN4	A218400S0006C
50.0	500	6	SN4	A218500S0006C
60.0	600	6	SN4	A218600S0006C
80.0	800	6	SN4	A218800S0006C

Note:  
1. Sizes which are not produced at Ghiloth Plant (1800) are 75, 100, 135 & 800mm ID (both plain pipe & in-line socket).  
2. Sizes which are not produced at Sitarganj Plant (1902) are 400, 500, 600 & 800mm ID (both plain pipe & in-line socket).  
3. Sizes which are not produced at Sangli Plant (1901) with in-line socket are 75, 100 & 135mm ID.



**DOUBLE WALL  
CORRUGATED  
PLAIN PIPE WITH  
RODENT REPELLENT  
(ONE COUPLER WITH TWO  
RUBBER RINGS)**

**HSN CODE: 39172190**

Size (cm)	Size (mm)	Length (m)	Stiffness Class	Product Code
7.5	75	3	SN8	A219075C0003B
10.0	100	3	SN8	A219100C0003B
13.5	135	3	SN8	A219135C0003B
15.0	150	3	SN8	A219150C0003B
17.0	170	3	SN8	A219170C0003B
20.0	200	3	SN8	A219200C0003B
25.0	250	3	SN8	A219250C0003B
30.0	300	3	SN8	A219300C0003B
40.0	400	3	SN8	A219400C0003B
50.0	500	3	SN8	A219500C0003B
60.0	600	3	SN8	A219600C0003B
80.0	800	3	SN8	A219800C0003B



**DOUBLE WALL  
CORRUGATED  
PLAIN PIPE WITH  
RODENT REPELLENT  
(ONE COUPLER WITH TWO  
RUBBER RINGS)**

**HSN CODE: 39172190**

Size (cm)	Size (mm)	Length (m)	Stiffness Class	Product Code
7.5	75	6	SN8	A219075C0006B
10.0	100	6	SN8	A219100C0006B
13.5	135	6	SN8	A219135C0006B
15.0	150	6	SN8	A219150C0006B
17.0	170	6	SN8	A219170C0006B
20.0	200	6	SN8	A219200C0006B
25.0	250	6	SN8	A219250C0006B
30.0	300	6	SN8	A219300C0006B
40.0	400	6	SN8	A219400C0006B
50.0	500	6	SN8	A219500C0006B
60.0	600	6	SN8	A219600C0006B
80.0	800	6	SN8	A219800C0006B



**DOUBLE WALL  
CORRUGATED  
WITH IN-LINE  
SOCKETED PIPE  
RODENT REPELLENT  
(WITH RUBBER RING)**

**HSN CODE: 39172190**

Size (cm)	Size (mm)	Length (m)	Stiffness Class	Product Code
10.0	100	3	SN8	A219100S0003B
15.0	150	3	SN8	A219150S0003B
17.0	170	3	SN8	A219170S0003B
20.0	200	3	SN8	A219200S0003B
25.0	250	3	SN8	A219250S0003B
30.0	300	3	SN8	A219300S0003B
40.0	400	3	SN8	A219400S0003B
50.0	500	3	SN8	A219500S0003B
60.0	600	3	SN8	A219600S0003B
80.0	800	3	SN8	A219800S0003B



**DOUBLE WALL  
CORRUGATED  
WITH IN-LINE  
SOCKETED PIPE  
RODENT REPELLENT  
(WITH RUBBER RING)**

**HSN CODE: 39172190**

Size (cm)	Size (mm)	Length (m)	Stiffness Class	Product Code
10.0	100	6	SN8	A219100S0006B
15.0	150	6	SN8	A219150S0006B
17.0	170	6	SN8	A219170S0006B
20.0	200	6	SN8	A219200S0006B
25.0	250	6	SN8	A219250S0006B
30.0	300	6	SN8	A219300S0006B
40.0	400	6	SN8	A219400S0006B
50.0	500	6	SN8	A219500S0006B
60.0	600	6	SN8	A219600S0006B
80.0	800	6	SN8	A219800S0006B

Note:  
1. Sizes which are not produced at Ghiloth Plant (1800) are 75, 100, 135 & 800mm ID (both plain pipe & in-line socket).  
2. Sizes which are not produced at Starganj Plant (1902) are 400, 500, 600 & 800mm ID (both plain pipe & in-line socket).  
3. Sizes which are not produced at Sangli Plant (1901) with in-line socket are 75, 100 & 135mm ID.

# D-REX FITTINGS

## DWC PIPE WITH AIR VENT SN8

HSN CODE: 34031900

Size (cm)	Size (mm)	Stiffness Class	Product Code
30.0	300	SN8	F023001002
40.0	400	SN8	F024001000
50.0	500	SN8	F025001001

## DWC PIPE WITH AIR VENT SN4

HSN CODE: 34031900

Size (cm)	Size (mm)	Stiffness Class	Product Code
30.0	300	SN4	F023001004
50.0	500	SN4	F025001003



## COUPLER

HSN CODE: 34031900

Size (cm)	Size (mm)	Product Code
7.5	75	M10090BCA0
10.0	100	M10110BCA0
13.5	135	M10135BDA0
15.0	150	M10150BTA0
17.0	170	M10200BBA0
20.0	200	M10200BSA0
25.0	250	M11250AAA0
30.0	300	M60300CAA0
40.0	400	M60400CAA0
50.0	500	M60500CAA0
60.0	600	M60600CAA0
80.0	800	M60800CAA0

One Coupler with two Rubber Rings.



## JACK

HSN CODE: 34031900

Size (cm)	Size (mm)	Product Code
13.5	135	TR99000135
15.0	150	TR99010150
17.0	170	TR99000170
20.0	200	TR99010200
25.0	250	TR99010250
30.0	300	TR99010300
40.0	400	TR99010400
50.0	500	TR99010500
60.0	600	TR99010600
80.0	800	TR99000800



## RUBBER RING

HSN CODE: 40169320

Size (cm)	Size (mm)	Product Code
7.5	75	RM06790048
10.0	100	RM06790074
13.5	135	RM06790052
15.0	150	RM06790083
17.0	170	RM06790012
20.0	200	RM06790084
25.0	250	RM06790081
30.0	300	RM06790076
40.0	400	RM06790077
50.0	500	RM06790078
60.0	600	RM06790037
80.0	800	RM06790089

Note: Customized fittings like End Caps, Bends, Tees, Reducers etc. will be available on request.

## FABRICATED BEND 45° SN4

HSN CODE: 34031900

Size (cm)	Size (mm)	Stiffness Class	Product Code
7.5	75	SN4	F020754001
10.0	100	SN4	F021004001
13.5	135	SN4	F021354002
15.0	150	SN4	F021504001
20.0	200	SN4	F022004001
25.0	250	SN4	F022504001
30.0	300	SN4	F023004001
40.0	400	SN4	F024004001
50.0	500	SN4	F025004002

## FABRICATED BEND 60° SN4

HSN CODE: 34031900

Size (cm)	Size (mm)	Stiffness Class	Product Code
10.0	100	SN4	F021005000
15.0	150	SN4	F021505001
17.0	170	SN4	F021705001
30.0	300	SN4	F023005001

## FABRICATED BEND 90° SN 4

HSN CODE: 34031900

Size (cm)	Size (mm)	Stiffness Class	Product Code
7.5	75	SN4	F020752001
10.0	100	SN4	F021002001
13.5	135	SN4	F021352003
15.0	150	SN4	F021502001
17.0	170	SN4	F021702001
20.0	200	SN4	F022002003
25.0	250	SN4	F022502001
30.0	300	SN4	F023002001
40.0	400	SN4	F024002001
50.0	500	SN4	F025002002

## FABRICATED BEND 45° SN 8

HSN CODE: 34031900

Size (cm)	Size (mm)	Stiffness Class	Product Code
7.5	75	SN8	F020754000
10.0	100	SN8	F021004000
13.5	135	SN8	F021354001
15.0	150	SN8	F021504000
17.0	170	SN8	F021704000
20.0	200	SN8	F022004000
25.0	250	SN8	F022504000
30.0	300	SN8	F023004000
40.0	400	SN8	F024004000
50.0	500	SN8	F025004001
60.0	600	SN8	F026004000

## FABRICATED BEND 60° SN 8

HSN CODE: 34031900

Size (cm)	Size (mm)	Stiffness Class	Product Code
10.0	100	SN8	F021005001
15.0	150	SN8	F021505000
17.0	170	SN8	F021705000
30.0	300	SN8	F023005000

## FABRICATED BEND 90° SN 8

HSN CODE: 34031900

Size (cm)	Size (mm)	Stiffness Class	Product Code
7.5	75	SN8	F020752000
10.0	100	SN8	F021002000
13.5	135	SN8	F021352002
15.0	150	SN8	F021502000
17.0	170	SN8	F021702000
20.0	200	SN8	F022002001
25.0	250	SN8	F022502002
30.0	300	SN8	F023002000
40.0	400	SN8	F024002000
50.0	500	SN8	F025002003
60.0	600	SN8	F026002000

Note: Customized fittings like End Caps, Bends, Tees, Reducers etc. will be available on request.

## FABRICATED TEE SN4

HSN CODE: 34031900

Size (cm)	Size (mm)	Stiffness Class	Product Code
7.5	75	SN4	F020751001
10.0	100	SN4	F021001004
13.5	135	SN4	F021351004
15.0	150	SN4	F021501010
17.0	170	SN4	F021701004
20.0	200	SN4	F022001010
25.0	250	SN4	F022501005
30.0	300	SN4	F023001010
50.0	500	SN4	F025001002

## FABRICATED REDUCER TEE SN4

HSN CODE: 34031900

Size (cm)	Size (mm)	Stiffness Class	Product Code
10.0x8.0	100x80	SN4	F021001005
13.5x8.0	135x80	SN4	F021351005
13.5x10.0	135x100	SN4	F021351006
15.0x7.5	150x75	SN4	F021501019
15.0x8.0	150x80	SN4	F021501015
15.0x10.0	150x100	SN4	F021501016
15.0x13.5	150x135	SN4	F021501014
17.0x10.0	170x100	SN4	F021701001
20.0x6.5	200x65	SN4	F022001014
20.0x10.0	200x100	SN4	F022001018
20.0x13.5	200x135	SN4	F022001012
20.0x15.0	200x150	SN4	F022001013
25.0x10.0	250x100	SN4	F022501007
30.0x10.0	300x100	SN4	F023001006
30.0x20.0	300x200	SN4	F023001003

## FABRICATED TEE SN8

HSN CODE: 34031900

Size (cm)	Size (mm)	Stiffness Class	Product Code
7.5	75	SN8	F020751000
10.0	100	SN8	F021001002
13.5	135	SN8	F021351000
15.0	150	SN8	F021501000
17.0	170	SN8	F021701000
20.0	200	SN8	F022001006
25.0	250	SN8	F022501001
30.0	300	SN8	F023001009
40.0	400	SN8	F024001001
50.0	500	SN8	F025001004

## FABRICATED REDUCER TEE SN8

HSN CODE: 34031900

Size (cm)	Size (mm)	Stiffness Class	Product Code
10.0x8.0	100x80	SN8	F021001003
13.5x8.0	135x80	SN8	F021351002
13.5x10.0	135x100	SN8	F021351001
15.0x7.5	150x75	SN8	F021501020
15.0x8.0	150x80	SN8	F021501004
15.0x10.0	150x100	SN8	F021501003
15.0x13.5	150x135	SN8	F021501005
17.0x10.0	170x100	SN8	F021701005
20.0x6.5	200x65	SN8	F022001005
20.0x10.0	200x100	SN8	F022001002
20.0x13.5	200x135	SN8	F022001007
20.0x15.0	200x150	SN8	F022001008
25.0x10.0	250x100	SN8	F022501002
25.0x15.0	250x150	SN8	F022501008
30.0x10.0	300x100	SN8	F023001005
30.0x15.0	300x150	SN8	F023001008
30.0x20.0	300x200	SN8	F023001001
30.0x25.0	300x250	SN8	F023001007



# D-REX FITTINGS

## FABRICATED TEE 95° SN4

HSN CODE: 34031900

Size (cm)	Size (mm)	Length (m)	Stiffness Class	Product Code
13.5	135	0.75 X 0.3	SN4	F021351003
15.0	150	2 X 1	SN4	F021501007
15.0	150	2.2X0.5	SN4	F021501012
15.0	150	2.4X0.5	SN4	F021501013
17.0	170	0.6 X 0.3	SN4	F021701003

## FABRICATED TEE 95° SN8

HSN CODE: 34031900

Size (cm)	Size (mm)	Length (m)	Stiffness Class	Product Code
15.0	150	2.4x0.5	SN8	F021501002
15.0	150	2.2x0.5	SN8	F021501001
17.0	170	06.x0.3	SN8	F021701002

## FABRICATED REDUCER COUPLER

HSN CODE: 34031900

Size (cm)	Size (mm)	Product Code
15.0x10.0	150x100	F021506000
20.0x10.0	200x100	F022006001
20.0x15.0	200x150	F022006000
25.0x15.0	250x150	F022506001
25.0x20.0	250x200	F022506000
30.0x10.0	300x100	F023006001
30.0x15.0	300x150	F023006000
30.0x20.0	300x200	F023006002
50.0x30.0	500x300	F025006000

## FABRICATED SINGLE Y SN8

HSN CODE: 34031900

Size (cm)	Size (mm)	Stiffness Class	Product Code
10.0	100	SN8	F021008000
13.5	135	SN8	F021358000
15.0	150	SN8	F021508002
30.0	300	SN8	F023008002

## FABRICATED SINGLE Y SN4

HSN CODE: 34031900

Size (cm)	Size (mm)	Stiffness Class	Product Code
10.0	100	SN4	F021008001
13.5	135	SN4	F021358001
15.0	150	SN4	F021508001
15.0	150	SN4	F021508003
40.0	400	SN4	F024008000

## FABRICATED REDUCER SINGLE Y SN4

HSN CODE: 34031900

Size (cm)	Size (mm)	Stiffness Class	Product Code
13.5x10.0	135x100	SN4	F021358003
20.0x10.0	200x100	SN4	F022008002
20.0x15.0	200x150	SN4	F022008003
25.0x10.0	250x100	SN4	F022508001
25.0x15.0	250x150	SN4	F022508002
30.0x10.0	300x100	SN4	F023008001

## FABRICATED REDUCER SINGLE Y SN8

HSN CODE: 34031900

Size (cm)	Size (mm)	Stiffness Class	Product Code
13.5x10.0	135x100	SN8	F021358002
15.0x10.0	150x100	SN8	F021508000
20.0x10.0	200x100	SN8	F022008000
20.0x15.0	200x150	SN8	F022008001
25.0x10.0	250x100	SN8	F022508000
25.0x15.0	250x150	SN8	F022508003
30.0x10.0	300x100	SN8	F023008000
40.0x10.0	400x100	SN8	F024008001
50.0x30.0	500x300	SN8	F025008000

Note: Customized fittings like End Caps, Bends, Tees, Reducers etc. will be available on request.

# D-REX FITTINGS

## FABRICATED DOUBLE Y SN4

HSN CODE: 34031900

Size (cm)	Size (mm)	Stiffness Class	Product Code
10.0	100	SN4	F021009001

## FABRICATED DOUBLE Y SN8

HSN CODE: 34031900

Size (cm)	Size (mm)	Stiffness Class	Product Code
10.0	100	SN8	F021009000

## FABRICATED CROSS SN4

HSN CODE: 34031900

Size (cm)	Size (mm)	Stiffness Class	Product Code
17.0	170	SN4	F021707001
25.0	250	SN4	F022507001

## FABRICATED CROSS SN8

HSN CODE: 34031900

Size (cm)	Size (mm)	Stiffness Class	Product Code
17.0	170	SN8	F021707000
25.0	250	SN8	F022507000

## FABRICATED REDUCER CROSS SN8

HSN CODE: 34031900

Size (cm)	Size (mm)	Stiffness Class	Product Code
17.0x10.0	170x100	SN8	F021707002

## FABRICATED END CAP

HSN CODE: 34031900

Size (cm)	Size (mm)	Product Code
15.0	150	F021501501
20.0	200	F022001501
25.0	250	F022501501
30.0	300	F023001501



## PIPE JOINT LUBRICANT

HSN CODE: 3403

Size (gm)	Product Code	Std. Pkg. (Nos.)
100	STINS-100	100
250	STINS-250	40
500	STINS-500	20



## DWC X PVC CONNECTOR (SPGXDWC)

(FOR MANHOLE INLET)

Size (D) cm	Product Code	Std. Pkg. (Nos.)
11.0 x 10.0	M1420014409	28
16.0 x 15.0	M1420014412	12



Size (D x H) cm	Product Code	Std. Pkg. (Nos.)
11.0x10.0	F183113110	01
16.0x15.0	F183176160	01
20.0x20.0	F183228200	01
25.0x25.0	F183291250	01
31.5x30.0	F183344315	01



Size (D x H) cm	Product Code	Std. Pkg. (Nos.)
11.0x10.0	F184113110	01
16.0x15.0	F184176160	01
20.0x20.0	F184228200	01
25.0x25.0	F184291250	01
31.5x30.0	F184344315	01



Size (D x H) cm	Product Code	Std. Pkg. (Nos.)
20.0x20.0	F182228200	01
25.0x25.0	F182291250	01
31.5x30.0	F182344315	01



# QUALITY CONTROL

Astral is equipped with state-of-the-art laboratory which specializes in high quality testing as per the ISI standards for testing of all D-Rex pipes. The high quality performance is attained and ensured throughout the plant in all the processes through experienced and well-qualified staff and skilled workers.

Each batch of Astral D-Rex pipes are rigorously tested as per Bureau of Indian Standard's relevant scheme of testing and inspection. Astral conducts the following high critical tests in its laboratory and the products are passed only after a strict quality check process.

## TESTS CONDUCTED ON PIPES

1. Raw Material Test including Density, MFR, OIT & Resistance to internal pressure Test
2. Dimension Test
3. Visual Appearance and colour of finished pipes
4. Resistance to Heating Test
5. Effect of Heating Test (If Applicable)
6. Ring Stiffness Test
7. Impact Strength Test
8. Ring Flexibility Test
9. Creep Ratio Test
10. Tightness of Elastomeric Ring Seal Joint Test
11. Water Tightness Test (If Applicable)
12. Resistance to combined Temperature Cycling and External Loading Test



# DESIGN AND INSTALLATION GUIDELINES

Pipe Installation should be done carefully with the adequate slope. Whether, the pipe is going to be installed inside a structure or outside it, the installation method will be the same. Depending on the sewer pipe material, things could be easier or more complicated, because the pipe will be harder to handle and the installation process of the sewer pipe will require additional labour and equipment. Installation of corrugated pipe includes typical procedures that are followed for any pipe installation. Since the strength of pipe completely depends upon the resistance offered by the surrounding backfill material is at its greatest, installation guidelines for the proper selection, placement and compaction of embedment materials will help ensure good, sound performance and extended service life.

These guidelines do not attempt to address installation practices common to all pipe types (e.g. line and grade, working in an upstream direction), but only those features that are important in securing pipe support from the embedment material. Consistent with that objective, no attempt is made herein to address safety concerns associated with the installation of corrugated pipe or underground construction in general. It is the responsibility of the user of this guide to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

## UNLOADING AND HANDLING

Care should be taken while unloading and handling the pipe, ensuring that it should not be dropped. Excessive swinging should be avoided while unloading the pipe.

Handling of Pipes using Slings for Lifting



## STACKING AND STORAGE

Stacking and storage of the pipes should be done in accordance with the prescribed guidelines in IS: 16098 (Part-2). It should be ensured that the pipe stacks are not in the vicinity of any type of heat source or engine exhausts. The rubber gaskets should especially be kept away from any such heat source. The general guidelines to be followed for the storage of D-Rex Corrugated Pipes are as given below. These guidelines are in line with the ones prescribed in IS: 16098 (Part-2).

- The area selected for stacking should be plain and care is to be taken to remove any pointed objects / stones from the area
- Place wooden blocks / plain, non - pointed stones as anchors to avoid stack collapse
- While stacking, pipes should be placed in an alternate coupler - socket / plain end manner as in Figure. 3, to ensure strong stability of the stack
- Stack height should not be higher than 2.5 m (8 ft)
- The stacks should be covered with an LDPE Sheet to avoid direct exposure to sunlight
- The area designated for stacking should preferably be cleared of any grass or vegetation

Figure 2:  
Anchors for Stack  
Collapse Prevention



Figure 3:  
Alternate Facing  
Pipes for Stable Stack



Figure 4:  
Covering of Stacks  
with LDPE Sheets



Figure 5:  
Actual on Field  
Stacking Example



# TRENCH PREPARATION

The width of sewer trench depends on the soil condition, type of side projection and the working space required at the bottom of the trench for smooth installations. Increase in width compared to required minimum width would unduly increase the load on pipe. Considering all the factors minimum trench width is specified in below table

MINIMUM TRENCH WIDTH - SIZE WISE	
PIPE DIAMETER (mm)	TRENCH WIDTH (m)
75 to 200	0.6
250	0.7
300	0.8
400	0.9
500	1.1
600	1.2
800	1.3

Figure 6: Trench Preparation Process



As mentioned in IS: 16098 (Part-2), excavated soil shall not be deposited near trench. This is in order to prevent the collapse of the sides of trenches. The sides of trench shall be supported by shoring, if necessary, to ensure proper excavation and to reduce the time of excavation. If excavation is made deeper than necessary the soil shall be backfilled and compacted.

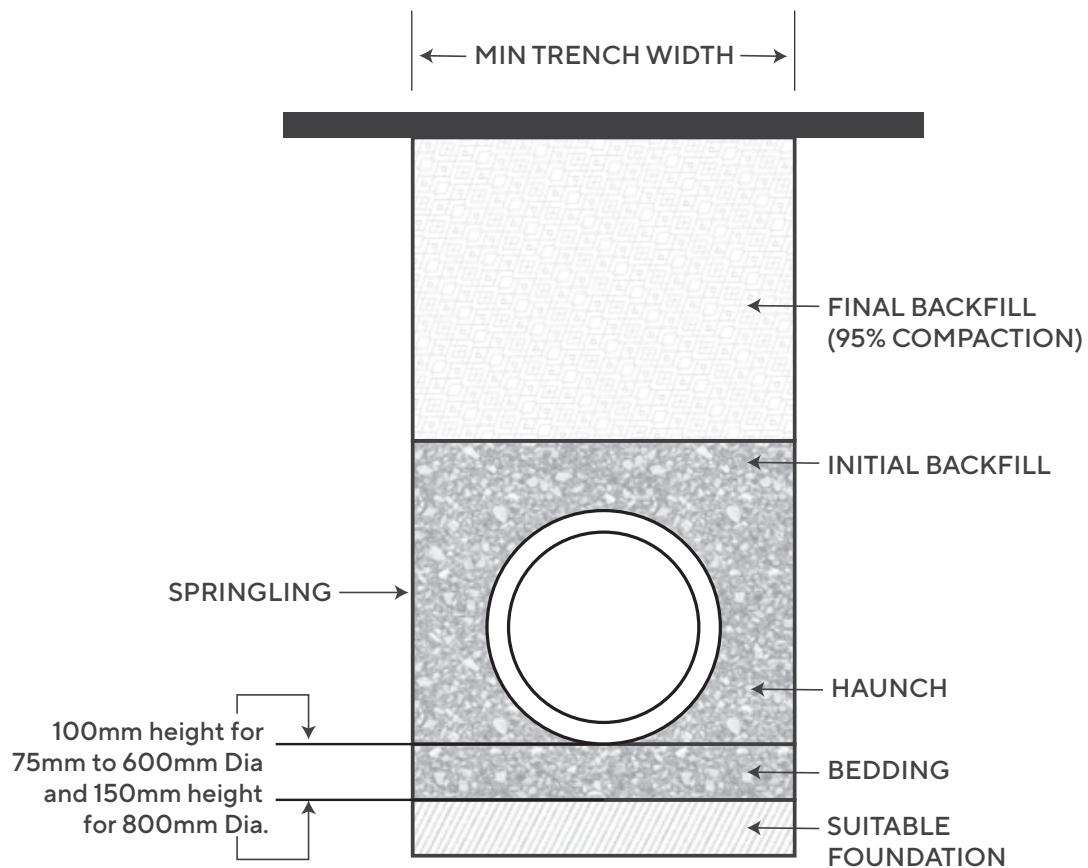


Figure 7: Cross Section of a Typical Trench

# MAXIMUM AND MINIMUM BURIAL DEPTHS FOR SN4 AND SN8 PIPES

Cover height is one of the determining factors when calculating the load carrying capacity of the pipe and soil envelop. Minimum cover heights are dependent on the backfill and proposed traffic loads. Increase in burial depth allows live load to be dispersed over a greater area of surrounding soil. On another side, it also increases the weight of the soil column directly above the pipe. Maximum cover heights are dependent on many variables including the stiffness class of the pipe, level of the ground water table, the backfill material used and the level of Maximum Burial Depth. SN4 pipes are recommended where traffic load (vehicular/live load) is low or negligible as well as where there are low burial depths. The recommended burial depth for SN4 and SN8 pipes shall be 0.8 M - 6.0 M.

## NOTES

1. Installation in accordance with IS: 16098 (Part-2) and ASTM D2321.
2. The actual cover height depends upon the type of backfill material and soil stiffness.
3. Minimum cover of depth shall be measured from the top of the pipe's crown to the top of the ground level.
4. Recommended design deflection limits are considered as per IS: 16098 (Part-2).

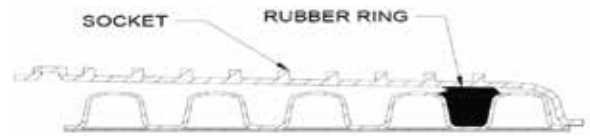
## BEDDING

- Normally, even for the maximum combined loading (wheel load + backfill), any form of cement concrete structural bedding would not be necessary.
- For maintenance of sewer slopes the initial backfill envelop with sand or gravel (as computed through structural design of buried flexible conduit) over a single BFS would be sufficient.
- If the anchorage becomes imperative, the transverse concrete anchorage blocks spaced at suitable interval shall also act as chairs for defining and maintaining the sewer slopes.
- If a pipe has a bell-and-spigot joint where the bell is significantly larger than the pipe, the manufacturer may require use of "bell holes" in the installation. Bell holes are depressions in the bedding designed to accommodate the connection so that a stress point does not occur. Since joint designs vary, manufacturers should be contacted regarding whether this is an essential construction technique for a specific product.



# RELIABLE SEALING

To secure long-term water tightness sealing rubber gasket is used. It provides the reinforcement to the plastic pipe joints to ensure long term leak proof jointing.



**Sealing Rubber Ring Placement with orientation**



**Joining of Pipe**



**Jointing in Progress in Excavated Trench**



Jointing of the pipes shall be done in the trench only.

## BACKFILLING

The backfill material and level of compaction directly impacts the performance of the pipe. The backfill material must have a high density as well as a resistance to migration and degradation to support the soil overburden and live vehicular loads.

## HAUNCHING ZONE

The haunching zone is the area of backfill that extends from the bedding up to the spring line of the pipe. In the haunch area, backfill material shall be well compacted as necessary, because it is a critical step to ensuring a high-performance installation. The embedment soil of a granular type is placed carefully in this zone.

## INITIAL BACKFILL

After compaction of haunching zone, backfill material should be placed in the shifts of maximum 300 mm and again compacted carefully. Depending on the application and the cover depth, the initial backfill extends from from the top of the pipe's crown to minimum 150 mm over top of the pipe. Class I material as per standard ASTM D2321 i.e. angular, crushed stone or rock, crushed gravel, broken coral, crushed slag, cinders or shells shall be preferred at 87% maximum standard Proctor density. Initial backfill protects the pipe from damage during final backfill.

## FINAL BACKFILL

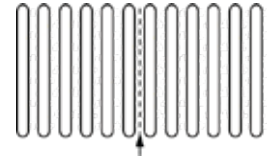
Final backfill material shall be as specified by project engineer based on site design to meet project requirements. The trench shall be further filled with soil without large stones or rocks and compacted. Typical values for proctor density shall be above 87%. The type of material used will determine the height of the lifts and the degree of compaction necessary to achieve the desired pipe support.



# FIELD CUTTING PIPE

Pipe lengths will usually need to be modified in the field to meet site requirements. Polyethylene pipe is easy to cut with hand saw, reciprocating saw, or similar tool. For pipes that will be connected to manhole or catch basin, the cut should be made in the corrugation valley, as shown in Figure 8.

Figure 8: Cut in corrugation valley



A variety of joint qualities and configurations are available. So, if the pipe is cut with the intent of joining it with another length of pipe, instructions should be obtained from the individual pipe manufacturer. This will ensure optimal joint performance.

Taps or connections coming into the pipe perpendicular to its axis, may also be needed to connect a downspout or similar small diameter pipe to the storm sewer. For systems not required to be watertight, options include using a fitting designed for such an application. Watertight systems may require additional fittings or adapters. Not all pipe sizes or types can be connected in this manner. In order to maintain the integrity of the main sewer line, the manufacturer should always be contacted for suggestions on these types of connections.

## LAYING AND JOINTING

### INSPECTION AND CLEANING

Before a pipe is laid into the trench, inspection of the pipe shall be done for any damage or defect. The sealing surface of the pipe shall be wiped using a cloth. Mud, sand or any other foreign material shall be removed from the socket interior as well as from spigot exterior to ensure an effective seal between the same. Gasket area shall be cleaned carefully. The pipe should be lowered into the trench using slings placed in a manner that evenly supports the pipe.

Figure 9: Cleaning of Sockets and Spigots for Efficient Jointing



### JOINTING

Socket and spigot to be assembled shall be aligned carefully before making joint. Spigot end shall be pushed in socket until the reference mark is flush with the end of socket. When mechanical devices are used, care must be taken to ensure that spigot is inserted to proper depth and that previously assembled pipe joints are not disturbed.

Figure 10: Example of Joint (Coupler Joint)



Figure 11: Pipe with Sealing Rubber Ring



### NOTE

- Ring should be placed in 1st groove if plain end of pipe is inserted in inbuilt socket of joining pipe.
- Ring should be placed in 3rd groove if plain end of pipe is inserted in loose injection moulded coupler

# CONNECTIONS TO MANHOLES & CATCH BASINS

Manholes and catch basins provide points for changes in pipe grade, direction, and size; allow storm runoff to enter; and provide for system access. The method used to join the pipe and the structure depends on the project needs, type of pipe, and the style of the structure. The most common practice for corrugated polyethylene and other pipes is to grout the pipe into the concrete manhole or basin opening. The grout mixture should be pressed between the corrugated pipe and the manhole opening. This type of connection is soil tight, as minimum, and is acceptable for the majority of storm sewers. Because of the corrugated exterior, this connection also creates a water stop effect. Flexible watertight connections, or manhole “boots” as they are sometimes called, are also available for projects requiring a tight system. These connections work best on a pipe with a smooth outer diameter and so may require the use of pipe adapters. Figure 12 provides additional detail on manhole and catch basin connections.

Pipe Installed at Manhole / Chamber

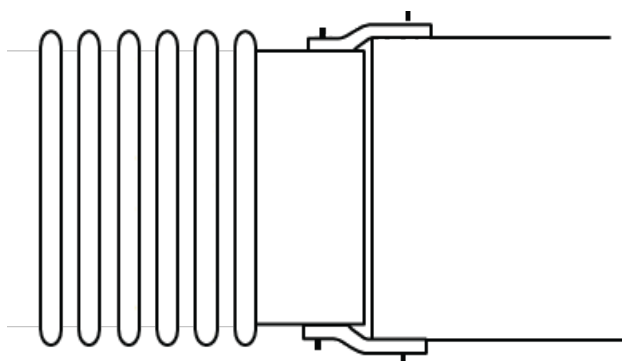


Figure 12

## CONNECTING CORRUGATED PE/PP PIPE TO OTHER PIPE MATERIALS

It is not unusual for corrugated polyethylene pipe to be connected to other types of pipe materials. Available options depend on the joint quality required throughout the system and the particular combination of pipe materials. In most storm sewer applications, the pipe can be joined by butting the pipe ends together, wrapping them with a geotextile, and pouring a concrete collar around them. Although such a connection is dependent on contractor expertise, it will generally limit soil intrusion but not provide a watertight joint. Watertight connections between different materials will require additional fittings and adapters. If those options are not acceptable, a manhole can be used to make the transition. One example of a watertight connection commonly used is shown in Figure 13. Pipe manufacturers are a valuable resource during the project planning stage since they are familiar with adapters that work well with their own products.

Figure 13: Watertight Connections Between Different Pipe Materials



# CLEANING METHODS- DOUBLE WALL CORRUGATED PIPES

Water Jetting is a sewer line cleaning process that uses large volumes of water under very high pressure to scour the walls of the drain and sewer lines. With Hydro Jetting, a high-pressure stream of water is injected into the septic line to clear obstructions like grease, hair, paper, sand, silt, and soap build up, and allow for the free flow of sewage through the system. This debris is then washed away to leave sewer or drain lines as clean as the day they were installed.

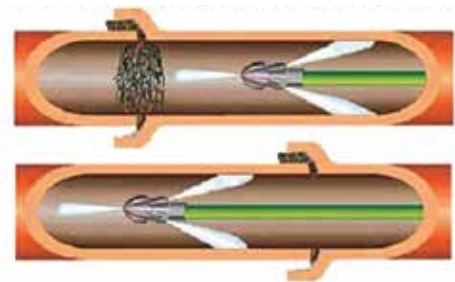
- Water jetting is a common method for pipe cleansing.
- A hose is led into the pipe, usually from the downstream, and water is jetted out under high pressure up pushing the hose forward while at the same time washing away the substances accumulated inside the pipe.

Hydrojet Drain Cleaning



## HIGH PRESSURE JETTING - THE BEST METHOD TO CLEAN SEWERS & DRAINS

- This method is particularly effective in clearing blockages caused by oil and grease. Grease/fat: full bore blockage of solidified fat and disposable nappies, consistent with typical operational blockages.
- Plastic pipe materials, structured-wall construction type. New plastics pipes, as well as those which had been in service several years, were subjected to 30 to 40 bar water pressures with a 2.8 mm nozzle.
- It is also very effective in clearing the grease coated onto the interior surface of the pipes so as to explore the pipe surface condition.
- However, the effectiveness of water jetting decreases with the increase in pipe diameter and is seldom used for pipes greater than 900 mm diameter.
- For pipes of length exceeding 100 m, the use of water jetting is also not effective due to the excessive head loss in the hose.
- Apart from normal cleansing, there are proprietary products available in the market for mounting onto the head of the water jetting hose for breaking through hard material.



## NOTE

- The guidelines mentioned in this booklet or to be used by end user/contractor as recommendations only.
- Our warranty is limited to only those components supplied by us i.e. indicated guidelines and their adoption by end user/contractor have no bearing on warranty.
- The final laying configuration is left to the expertise of the project designer only.
- These guidelines are not intended to supersede any of the governing specifications, standards and requirements.

# COMPARISON OF DWC PIPE & RCC PIPE

PROPERTIES	D-REX PE/PP DOUBLE WALL CORRUGATED PIPE	RCC PIPE
Metallurgical Property	Good flexural strength, not brittle	No Flexibility, very brittle
Structural Property	Flexible Joints - allows deformation and movement that won't damage structure under external load.	When bearing external load, even very small deformation will damage the structure of pipe.
Chemical Inertness	Immune to all corrosive chemicals and biological ingredients. No possibility of 'Crown Corrosion'	Deteriorates rapidly in contact with mild chemicals and biological contents. Required frequent maintenance. Higher susceptible to crown corrosion.
Life Expectancy	Designed Life up to 75 – 100 Years. Time tested up to 50 years in various Parts of world.	Maximum life not more than 20 years
Installation time	Light weight, ease in transportation, handling and installation results in a Favorably low installation time & costs.	Cumbersome and intensive labour & Tooling oriented in Transportation, handling & installation
Available lengths	Available in 6 (Six) Meter Standard lengths. Can be cut to any length by simple hand tools. Length can also be customized as per requirement.	Available in 2.5 meters Lengths only. Cannot be reduced to shorter lengths by simple cutting at site
Transportation & Handling	Due to light weight and flexibility, chance of damage during handling & transportation is negligible. Easy to ensure closed end water Test at field after installation.	Highly susceptible to damage during transportation & handling. Once damaged, repair may not be at all Possible.
Maintenance Status	There is virtually no need for maintenance. Periodical pressure flushing will keep the inner surface of the pipe glass smooth for its Entire life.	Considerable quantum of annual maintenance budget allocation is necessary to keep the system Working.

# FREQUENTLY ASKED QUESTIONS (FAQ)

## **01. How much load D-Rex pipe can take?**

Load bearing capacity is measured in SN Class. SN 1 is equivalent to 100 kg/m<sup>2</sup> of Load. D-Rex pipes are available in SN4, SN8 and SN 16 varieties corresponding to 400 kg/m<sup>2</sup>, 800 kg/m<sup>2</sup> and 1600 kg/m<sup>2</sup> load bearing capacity respectively.

## **02. Up to what max. Depth D-Rex pipe can be used?**

As per the governing standard, D-Rex pipes can be laid upto a depth of 6 m Depth. However, these depth values depend on slopes, soil type and other factors related to the project.

## **03. Up to what min. depth we can lay D-Rex pipes?**

As per governing standard, the min. depth should be more than 0.8 m.

## **04. Where we can use SN4 & SN8 Class pipes?**

As described in point no. 2, the depth may vary based on project planning, but load bearing strength depends on the density of dynamic and static load elements such as vehicular traffic and / or structural loads on the pipes.

## **05. What is the life of rubber ring?**

Multiple literatures are available in market which suggest that the life of the rubber rings can be anything between 20 years - 50 years depending on application and frequency of contact with UV radiation (Since, any rubber / plastic element gains brittleness with increase in contact with UV radiation)

## **06. What type of rubber is used for rubber ring?**

Rubber ring is made up of Neoprene or EPDM rubber.

## **07. Is it possible to use D-Rex pipes in basement parking where suspended SWR pipes are used?**

DWC D-Rex pipes are designed for non-pressure underground drainage application only. Not to be exposed to open or above ground level. So it is not advisable to use in basement parking in suspended position.

## **08. How to repair D-Rex pipes if damaged or punctured?**

If pipes are damaged or punctured, the punctured portion, once identified, should be cut out, and replaced with a new portion by using connecting couplers on both sides.

## **09. In case of Rodding pipes will damage?**

Yes, Rodding damages any type of plastic pipes. Hence, for D-Rex Corrugated pipes, it is recommended that instead of rodding, hydro jetting mechanism may be considered.

## **10. How to join with previous RCC or PVC pipes?**

Connections between different MOCs in sewerage and drainage network projects are carried out by insertion of a constructed or pre-fabricated manhole or chamber. However, in case, such construction or addition poses a challenge, then, use of Repairing Couplers can be considered.

## **11. Is it possible to pass hot water through D-Rex pipes?**

The D-Rex pipes are designed to suit the temperatures and other conditions observed in sewage / domestic wastewaters. Hence, the pipes sustain the standard temperatures ranging from 20°C to 40°C in normal conditions. However, as a part of testing w.r.t. IS code requirements, the pipes are tested for temperatures upto 80°C for stability purpose. But, as a standard declaration, the D-Rex pipes are not designed for higher temperature / hot water transport.

## **12. What is Life of DWC Pipe?**

As per the standard references, the life PE/PP Pipes (DWC is not a material but a type of pipe) ranges between 50 - 100 years.

## **13. Can rodent damage the pipes?**

Yes. Damage due to pests can be a possibility. However, if such a possibility is envisaged, Astral Pipes' Infra Division can supply D-Rex pipes with Anti-Rodent Properties. However, it is to be noted that this does not eliminate the possibility of damage, but limits the extent of it.

## **14. What is the effect of chemicals on these pipes?**

Pipes are chemically inert.





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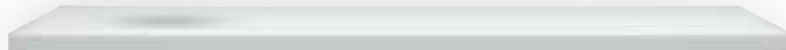
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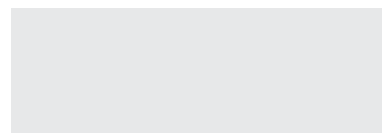
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