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Sintex UltraX | PVC-O PLUS

Commitment Beyond Installation

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About Welspun

Welspun has successfully made its mark and more across businesses such as home textiles, advanced textiles, flooring solutions, retail, infrastructure, warehousing, line pipes, DI pipes, stainless steel & alloy, pig iron, TMT rebars and more.

Presence in more than **50 countries**

$5 billion **USD** turnover

30,000 Plus employees across global locations

Over 100,000 shareholders

20+ Manufacturing Facilities in **India, USA, KSA** and present in **50+ countries**

Our Vision

Delight our customers through innovation and technology, achieve inclusive and sustainable growth to remain eminent in all our businesses.

Our Mission

We aim to be amongst :

The top 2 value creators in each of our businesses.

The top 10 most respected Indian brands.

The top 50 Groups in India in terms of market value.

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Legacy Of Sintex

- Iconic water storage tank brand of India since **50 years**
- **200 litres** to **16 Lakh** litres of tank capacity for retail & commercial usage
- Category creators & leaders with top-class consistent quality & innovation
- Sintex is now a part of Welspun World, a **$5 billion** Indian conglomerate

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Commitment Beyond Installation.

With a responsibility that goes beyond installation. With a commitment that goes well beyond quality. To India's communities. To India's rise.

At Sintex, we believe our job doesn't end once the pipes are laid — that's where it truly begins. From on-ground support to post-installation guidance — we stay invested, involved, and accountable.

To fulfill this ongoing commitment, in partnership with global leaders Rollepaal, we proudly introduce Sintex UltraX PVC-O Pipes — engineered not just for performance at installation, but for reliability over a lifetime.

- Ultra Strength
- Ultra Performance
- Ultra Durability
- Ultra Commitment

Welspun

Ultra Features:

1st Time In India

- Each pipe is 100% hydrotested.
- WRAS Certified Elastomeric Rings
- QR Code on each pipe for end-to-end traceability.
- 100% Lead-free Pipes.
- Best-in-class strength to weight ratio, for easy transportation and installation.
- Assured Class 500 (MRS 50) Pipes.

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When Strength Matters, UltraX Delivers

1. Drop Test (4m Drop)

2. Single Point Notch Test

3. Impact Test

4. Run Over Test

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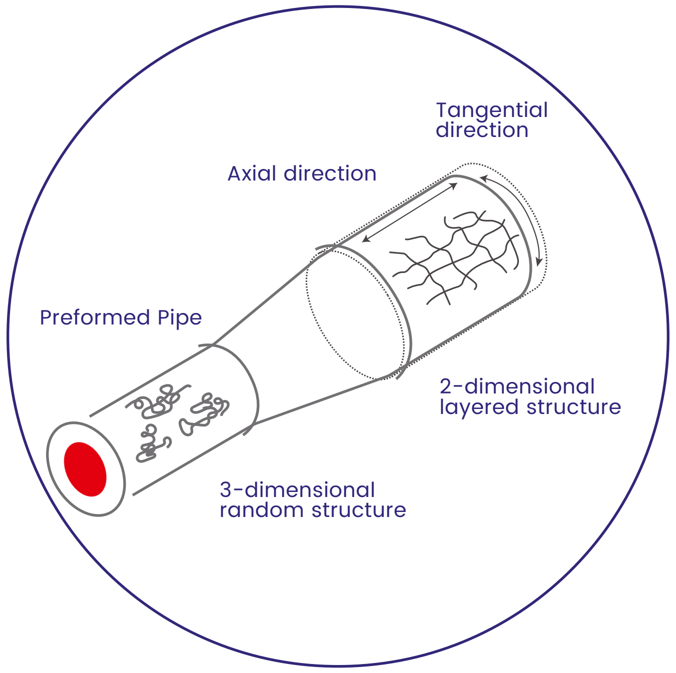
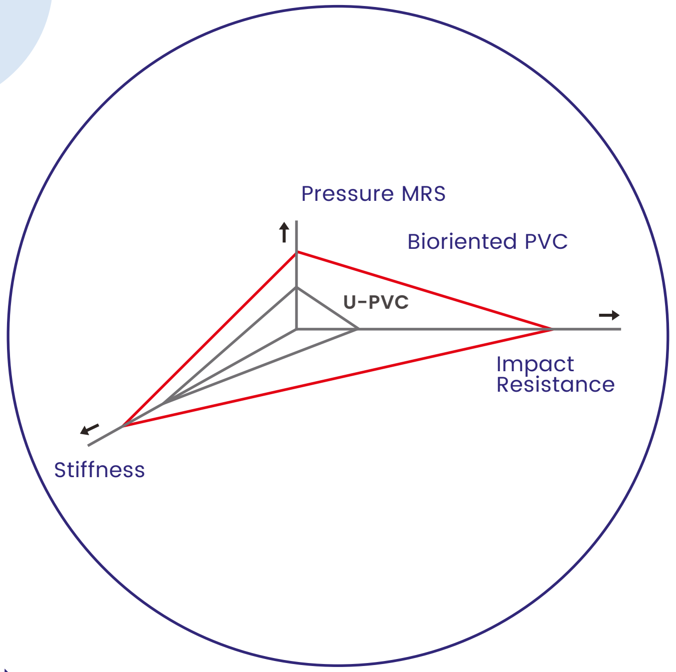
Molecular Biaxial Orientation

- It is the process of stretching the pipe walls
- Realized at a temperature
- Immediately followed by the process of quenching of the pipe to room temperature
- This process brings a preferential orientation of molecules parallel to the surface
- This entire process results in a quasi-lamellar structure of the pipe walls





Biaxial Orientation Benefits

- The bi-orientation process results in a PVC-O Pipe that has improved impact strength, with the highest flow capacity
- The pipes have a higher pressure resistance with the least effect on water quality
- PVC-O Pipes are stiffer at the same wall thickness as UPVC Pipes
- The C value remains constant throughout the service lifecycle of the PVC-O Pipe

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What are PVC-O Pipes?

PVC (oriented) or PVC-O Pipes are manufactured by processing polyvinyl chloride molecules through Biaxial Orientation of regular PVC Pipe. Biaxial Orientation is a manufacturing process in which the PVC pipe gets stretched to orient polyvinyl polymeric chains parallel to the plain of the pipe.

Why are PVC-O Pipes good?

As a considerably stronger polymer than most, PVC-O Pipes have self-evident advantages over PVC and Ductile Iron Pipes:

Corrosion-free materials

- PVC-O is immune to corrosion and to natural chemical substances
- Does not need any type of special protection or coating
- Significant cost savings in using PVC-O Pipes instead of DI Pipes
- Water quality remains unchanged

Easy to handle and install

- PVC-O Pipes are lighter and easier to handle than DI Pipes
- No machinery is required for installation. Can be done manually
- In terms of installation, in both material and time, PVC-O Pipes offer huge advantages

Smooth inner surface and higher impact resistance

- PVC-O Pipes have a smooth inner surface
- The C-value (Hazen-Williams roughness constant) is 150 for PVC-O Pipe and 130 for Ductile Iron Pipe
- Because of a layered structure, impact resistance for PVC-O Pipes is higher than that of any other pipes

High pressure pumping lines

PVC-O Pipes Class 500 with Homogenous Spigot can be used for High Pressure Pumping Lines in water supply/conveyance.

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World-class Technology from Rollepaal

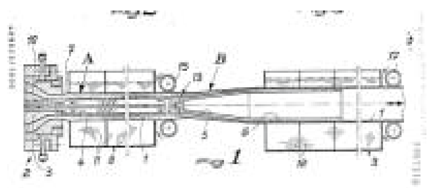
Two different process principles

Water Based / Air Based

In-Line

Orientation unit directly connected to the extrusion process. Feedstock extrusion and Orientation is one in line process.

Petzetakis 1972
Upo-Vindex 1996
Wavin 1995
Alphacan 2000
Pipelife 2001

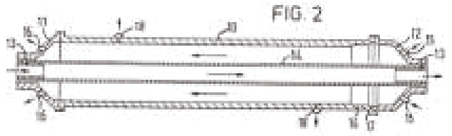


Off-Line (batch)

Orientation unit is not connected to the extrusion process/die head. Feedstock extrusion is independent from orientation process.

YIP-Uponor 1982
Uralita
Alphacan 1998
Pipelife

FIG. 2



About Rollepaal

- Rollepaal boasts over 60 years of expertise in pipe production and PVC Pipe extrusion technology
- Rollepaal's PVC-O technology uses mandrel and air-based in-line methods, ensuring a reliable, controllable and adjustable process
- Its unique air-based pipe orientation reduces energy consumption, making Rollepaal a cost-effective solution
- Each line features wall thickness scanning technology and gravimetric material feeding, automatically minimizing overweight without operator input
- Rollepaal is acclaimed for its advanced PVC-O Pipe production, driven by its proprietary RBlue mandrel and air-based in-line process

The Science of Rollepaal's Superior In-Line Technology

- Lowest overweight due to integral process control (difference absolute 15% to off-line) resulting from the lowest wall thickness variation in the pipe length
- Quality control of end product: all products are scanned
- Guaranteed controlled biaxial stretching
- Highest production speeds
- Highest automation degree using hands-off principle
- Reliable in-line process compared to batch process with cycle time issues
- Extrusion process is part of production
- Different lengths are easy to produce
- Older pipes cannot be re-stretched

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Why is Sintex UltraX PVC-O Plus Pipe better?

Welspun + Sintex + Rollepaal

- Each pipe is 100% hydrotested (1st Time In India)
- 100% Lead-free Pipes
- Use of Restrain Rings & Joints for Hilly/ Rocky Areas
- Leak Detection & Traceability Services
- WRAS Certified Elastomeric Rings
- Sustainable Material Which is 100% Recyclable
- QR Code & Jointing Instruction Label on Pipes

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Applications of PVC-O Pipes

Potable Water Supply -

PVC-O Pipes are primarily suitable for high-pressure water distribution systems and also residential and commercial buildings where water safety is a critical concern.

Irrigation System -

Food safety regulations require using safe water in irrigating agricultural lands, where PVC-O Pipes are the best choice.

Water Distribution System -

PVC-O Pipes are used in water supply systems across Indian cities and towns. Their high strength and resistance to corrosion make them a reliable choice for ensuring long-lasting water distribution networks.

Sewage & Drainage Network -

These pipes ensure efficient and hygienic waste disposal, preventing the accumulation of sewage within the system.

IS 16647

Welspun

Wall thickness & weight of PVC-O Pipe-C=1.4 Vs C=1.6

Dimensions of PVC-O Pipes as per IS 16647: 2017

PN 12.5 BAR-CLASS 500 C = 1.4

SIZES	OD		Thickness		
	Min.	Max.	Min.	Max.	Avg.
110	110.0	110.4	2.0	2.5	2.3
160	160.0	160.5	2.9	3.4	3.2
200	200.0	200.6	3.6	4.2	3.9
250	250.0	250.8	4.5	5.2	4.9
315	315.0	316.0	5.7	6.5	6.1
400	400.0	401.2	7.2	8.2	7.7
450	450.0	451.4	8.3	9.4	8.9
500	500.0	501.5	9.2	10.4	9.8
560	560.0	561.7	10.3	11.6	11.0
630	630.0	631.9	11.6	13	12.3

PN 12.5 BAR-CLASS 500 C = 1.6

SIZES	OD		Thickness		
	Min.	Max.	Min.	Max.	Avg.
110	110.0	110.4	2.3	2.8	2.55
160	160.0	160.5	3.3	3.9	3.6
200	200.0	200.6	4.1	4.8	4.45
250	250.0	250.8	5.1	5.9	5.5
315	315.0	316.0	6.4	7.3	6.85
400	400.0	401.2	8.1	9.2	8.85
450	450.0	451.4	9.3	10.5	9.9
500	500.0	501.5	10.4	11.7	11.05
560	560.0	561.7	11.6	13.0	12.3
630	630.0	631.9	13.0	14.6	13.8

PN 16 BAR-CLASS 500 C = 1.4

SIZES	OD		Thickness		
	Min.	Max.	Min.	Max.	Avg.
110	110.0	110.4	2.6	3.1	2.9
160	160.0	160.5	3.7	4.3	4.0
200	200.0	200.6	4.6	5.3	5.0
250	250.0	250.8	5.8	6.4	6.1
315	315.0	316.0	7.2	8.2	7.7
400	400.0	401.2	9.2	10.4	9.8
450	450.0	451.4	10.3	11.6	11.0
500	500.0	501.5	11.4	12.8	12.1
560	560.0	561.7	12.8	14.4	13.6
630	630.0	631.9	14.4	16.1	15.3

PN 16 BAR-CLASS 500 C = 1.6

SIZES	OD		Thickness		
	Min.	Max.	Min.	Max.	Avg.
110	110.0	110.4	2.9	3.4	3.15
160	160.0	160.5	4.2	4.9	4.55
200	200.0	200.6	5.2	6.0	5.6
250	250.0	250.8	6.5	7.4	6.95
315	315.0	316.0	8.1	9.2	8.65
400	400.0	401.2	10.3	11.6	10.95
450	450.0	451.4	11.6	13.0	12.3
500	500.0	501.5	12.9	14.4	13.65
560	560.0	561.7	14.4	16.1	15.25
630	630.0	631.9	16.2	18.1	17.15

PN 20 BAR-CLASS 500 C = 1.4

SIZES	OD		Thickness		
	Min.	Max.	Min.	Max.	Avg.
110	110.0	110.4	3.2	3.8	3.5
160	160.0	160.5	4.6	5.3	5.0
200	200.0	200.6	5.7	6.5	6.1
250	250.0	250.8	7.2	8.2	7.7
315	315.0	316.0	9.0	10.2	9.6
400	400.0	401.2	11.4	12.8	12.1
450	450.0	451.4	12.8	14.3	13.6
500	500.0	501.5	14.2	15.9	15.1
560	560.0	561.7	15.9	17.7	16.8
630	630.0	631.9	17.9	19.9	18.9

PN 20 BAR-CLASS 500 C = 1.6

SIZES	OD		Thickness		
	Min.	Max.	Min.	Max.	Avg.
110	110.0	110.4	3.6	4.2	3.9
160	160.0	160.5	5.1	5.9	5.5
200	200.0	200.6	6.4	7.3	6.9
250	250.0	250.8	8.0	10.1	9.1
315	315.0	316.0	10.1	11.4	10.8
400	400.0	401.2	12.8	14.3	13.6
450	450.0	451.4	14.4	16.1	15.3
500	500.0	501.5	16.0	17.9	17.0
560	560.0	561.7	17.9	19.9	18.9
630	630.0	631.9	20.1	22.4	21.3

PN 25 BAR-CLASS 500 C = 1.4

SIZES	OD		Thickness		
	Min.	Max.	Min.	Max.	Avg.
110	110.0	110.4	4.0	4.7	4.4
160	160.0	160.5	5.8	6.6	6.2
200	200.0	200.6	7.2	8.2	7.7
250	250.0	250.8	9.0	10.2	9.6
315	315.0	316.0	11.4	12.8	12.1
400	400.0	401.2	14.4	16.1	15.3
450	450.0	451.4	16.2	18.1	17.2
500	500.0	501.5	18.0	20.1	19.1
560	560.0	561.7	20.2	22.5	21.4
630	630.0	631.9	22.7	25.2	24.0

PN 25 BAR-CLASS 500 C = 1.6

SIZES	OD		Thickness		
	Min.	Max.	Min.	Max.	Avg.
110	110.0	110.4	4.5	5.2	4.9
160	160.0	160.5	6.5	7.4	7.0
200	200.0	200.6	8.1	9.2	8.7
250	250.0	250.8	10.2	11.5	10.9
315	315.0	316.0	12.8.	14.3	13.9
400	400.0	401.2	16.2	18.1	17.2
450	450.0	451.4	18.2	20.3	19.3
500	500.0	501.5	20.3	22.6	21.5
560	560.0	561.7	22.7	25.2	24.0
630	630.0	631.9	25.5	28.3	26.9

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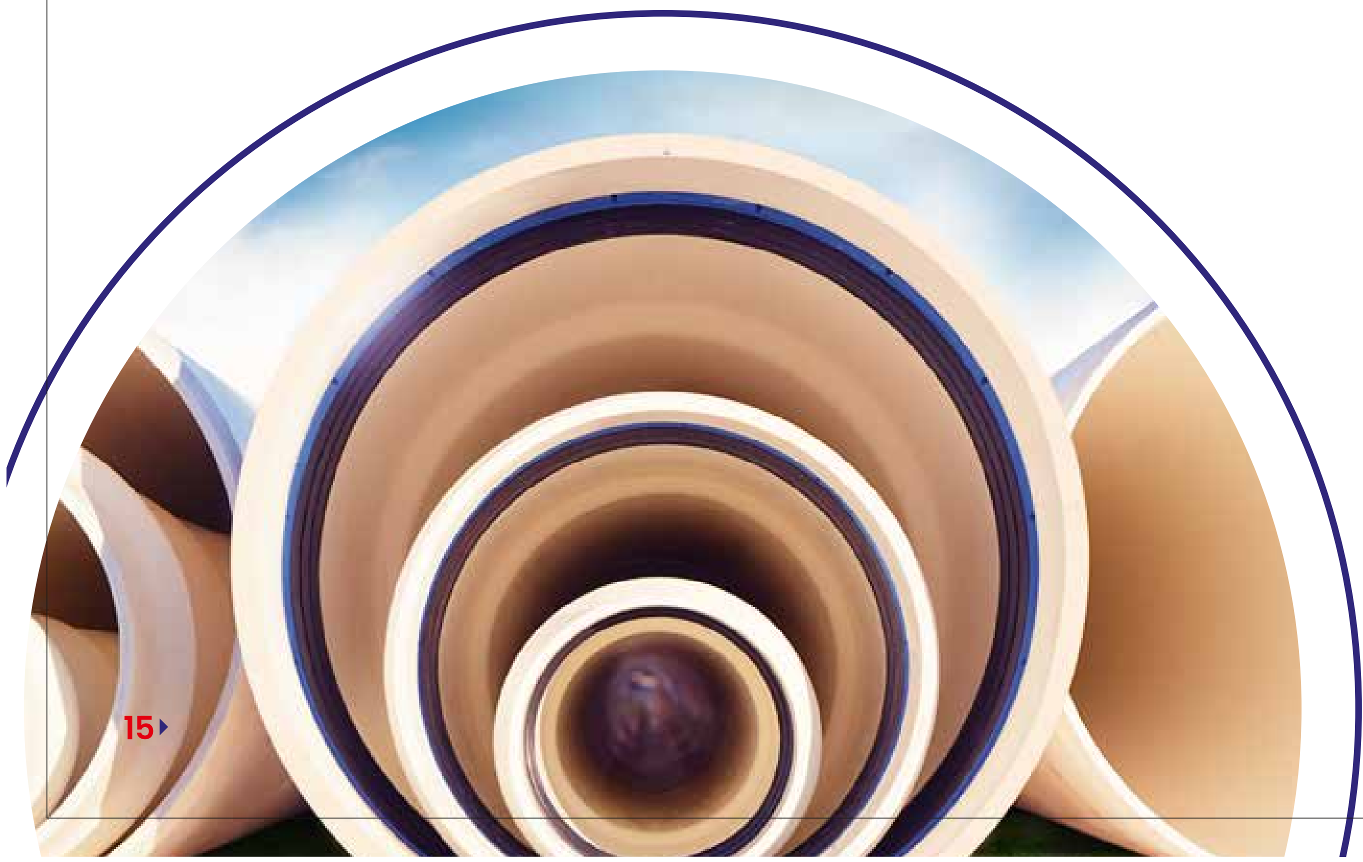
Sustainable Pipes

Pipes that keep the environment SAAF, SAFE & SAHI.

- CO_2 and energy consumption indicators were compared for pipes of different materials
- PVC-O Pipes release 80% of CO_2, compared to PE100 and UPVC Pipes due to lesser weight and thickness
- Most CO_2 emissions come from used phase of PVC-O Pipes (50 years)
- PVC-O Pipes require lower pumping energies than UPVC Pipes, with a similar conclusion for energy release
- Since PVC-O Pipes have a greater internal diameter for the same external diameter when compared to U-PVC Pipes, they require lower pumping energies. Similar conclusions could be drawn for the energy release
- Green choice- Safe when manufactured, use and conveying of precious water supply and saves electricity



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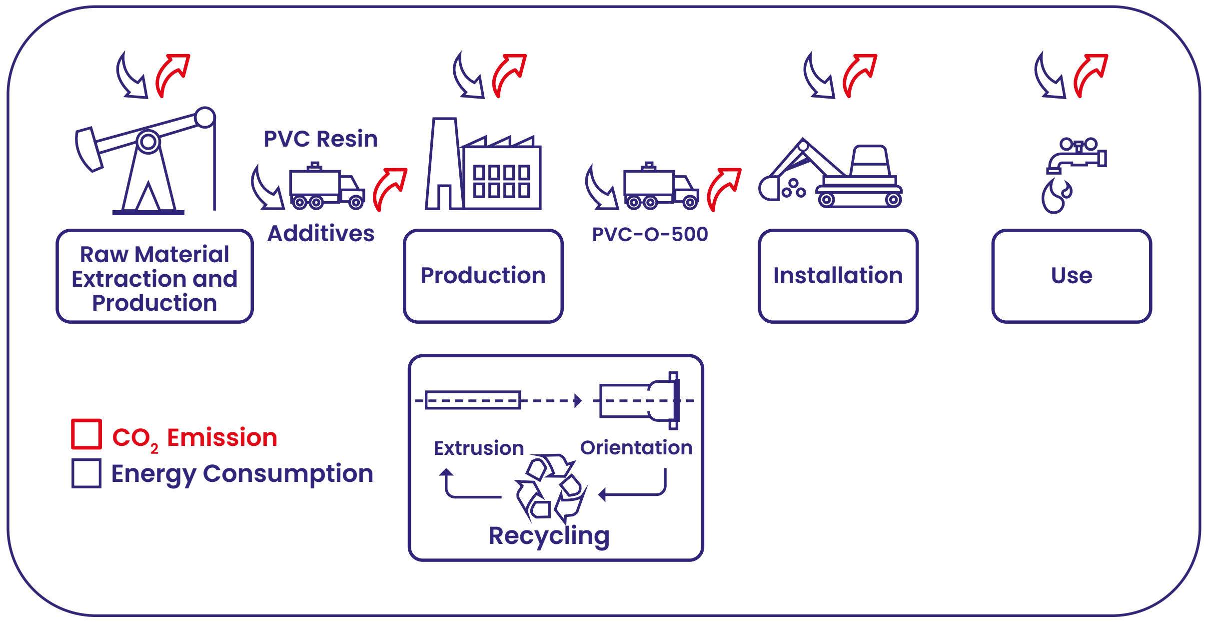
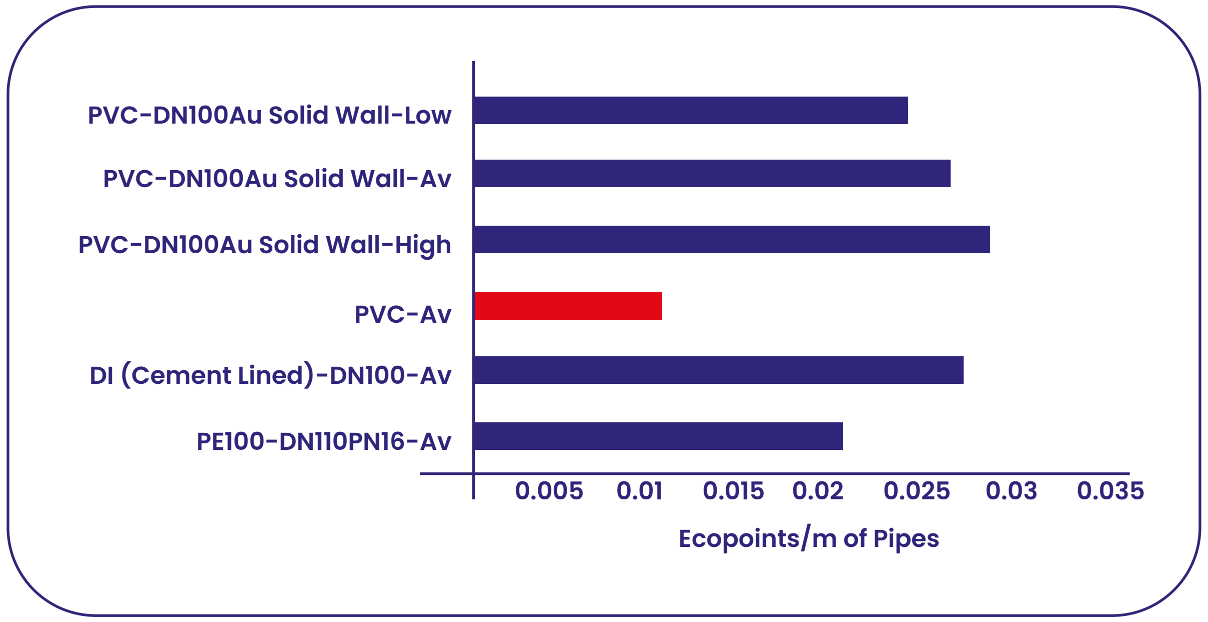
Lifecycle of PVC-O Pipes



PVC-O Pipes require lesser pumping energy than HDPE and DI Pipes and release less energy. Resulting in a better environmental impact.

Edge Environment Chart



Edge Environment chart compares the different pressure pipe options on the basis of EcoPoint ratings, where the higher the rating, the greater the environmental impact.

Sustainability

Sintex Ultra X PVC-O Pipe represents a sustainable pipe, incorporating design considerations for environmental preservation, encompassing aspects such as energy conservation, sustainable utilization of natural resources, durability of structures, and the eco-friendliness of materials.

Within this framework, the impact of the Sintex Ultra X PVC-O Pipe on 14 environmental factors is studied, categorized based on their effects on different environmental aspects:

Air and atmosphere

Climate change, acidification, depletion of the ozone layer and photochemical ozone formation.

Water

Resource depletion (water), freshwater toxicity and water eutrophication.

Soil

Depletion of resources (minerals), land eutrophication and ground use.

Human health

Inorganic respiratory elements, ionizing radiation, effects on human health (cancer-causing / non-cancerous)

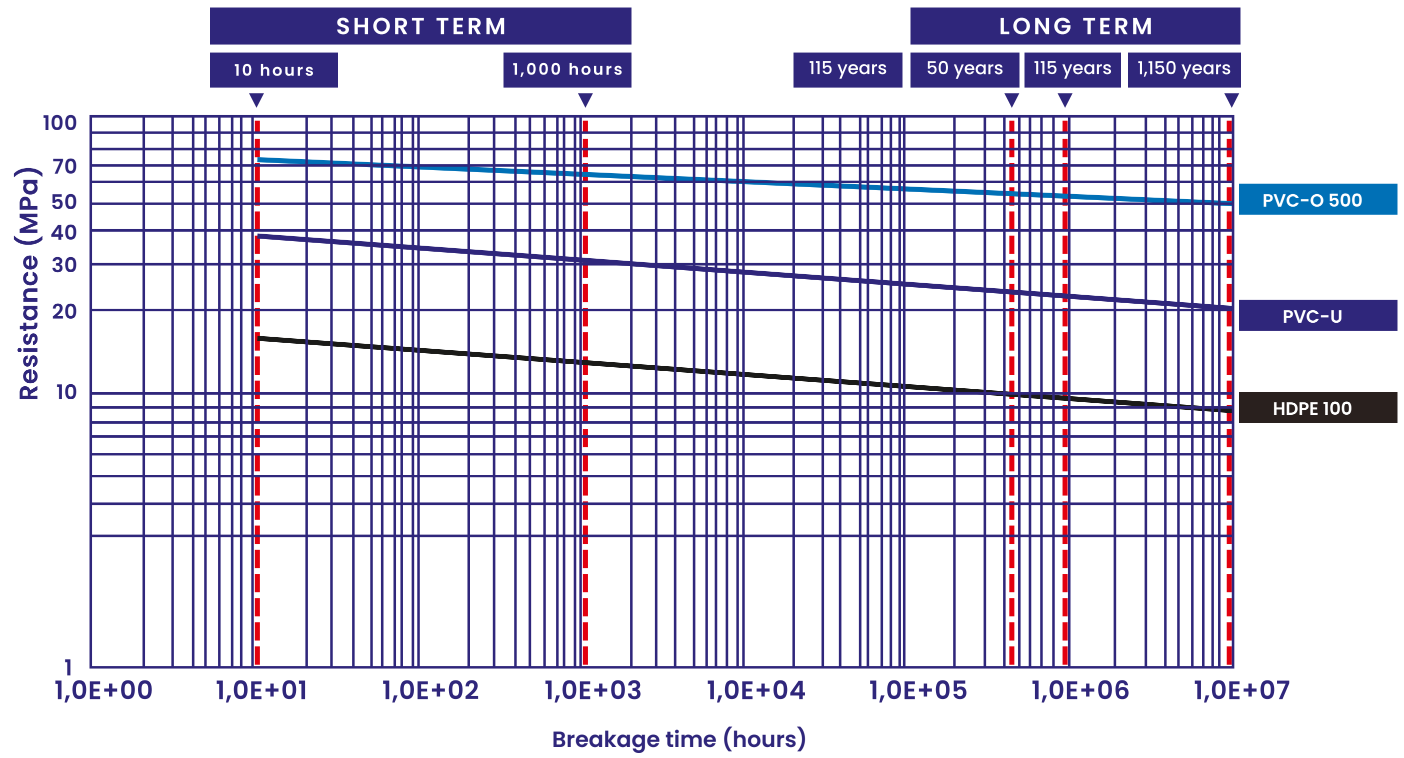
Environmental impacts	Absolute	
Climate Change	8.3E+01	kg CO2e
Ozone depletion	5.3E-06	kg CFC-11e
Ecotoxicity – aquatic, fresh water	1.8E+02	CTUe
Human toxicity – cancer effects	4.8iE-06	CTUe
Human toxicity - non-cancer effects	8.6E-06	CTUh
Particulate matter / Respiratory inorganics	1.3E-02	kg PM2.5e
Ionising radiation – human health effects	5.3E+00	kg U235e
Photochemical ozone formation	4.1E-01	kg NMVOC
Acidification	4.1E-01	mol H+e
Eutrophication - terrestrial	1.0E+00	mol Ne
Eutrophication – aquatic, fresh water	1.6E-03	kg Pe
Eutrophication – aquatic, sea water	9.5E-02	kg Ne
Resource depletion – water	1.9E-01	m³ SWU
Resource depletion – mineral, fossil	3.8E-03	kg Sbe
Land transformation	1.6E+02	kg Cdef

Stress Regression Line

- Given the higher tensile strength of PVC-O Pipes, they have a superior long-term hydrostatic resistance than conventional plastic pressure pipes. This is confirmed by the following Stress Regression Graph
- As seen in the following radar plot, PVC-O Pipes have superior fatigue resistance, compared to UPVC Pipes
- Cyclic fatigue testing conducted by the University of Queensland determined that PVCO Pipes have up to four times the resistance to cyclic fatigue, compared to UPVC Pipes

Sintex Ultra X PVC-O Plus Pipes offer superior long-term strength and ultra-high fatigue resistance, lasting up to four times longer than conventional UPVC Pipes.

Long-term regression analysis of PVC-O, PVC-U and HDPE Pipes.



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Piping and Material Mechanical Properties

The material of a pipe decides its performance, at Sintex we go beyond and deliver as our commitment is to give and provide the best.

The following table summarizes the technical characteristics of Sintex Ultra X PVC-O Pipes in comparison with other plastic pipes. Showcasing how the pipes are a class above its contemporaries.

		PVC-O 500		PVC	HDPE-100	HDPE-80
Product Standard	Units	IS 16647 UNE-EN 17176	Standard 16422	UNE-EN 1452	UNE-EN 12201	UNE-EN 12201
Minimum Required Strengh (MRS)	MPa	50.0	-	25.0	10.0	8.0
Overall Service Coefficient (C)	-	1.4	1.4	2.0	1.25	1.25
Design Stress (O)	MPa	36.0	36	12.5	8.0	6.3
Short Term Elasticity Modulus (E)	MPa	4,000	4000	>3,000	1,100	900
Resistance to Uniaxial Traction	MPa	>48	≥48	>45	19	19
Resistarnce to Hoop Traction	MPa	>85	85	>45	19	19
Shore Hardness D at 20°C	-	81-85	81-85	70-85	60	65

- For pipes with a DN >110.
- Test values based on water temperature
- IS 16647 values based on 27 degree water temperature
- ISO 16422 values based on 20 degree water temperature

Other Material Characteristic

The table below shows other, non-mechanical characteristics of Sintex Ultra X PVC-O Plus.

The values show that Sintex with its PVCO Pipe has gone above and beyond. Adding the X Factor coupled with ultra effort.

Characteristic	Units	Value
Density	g/cc	1.40-1.46
PVC Resin K value	-	>64
Poisson co-efficient	-	0.4
Vicat temperature	°C	>80
Lineal expansion co-efficient	°C-1	7.10
Thermal conductivity	Kcal/mh°C	0.14-0.18
Specific heat at 20°C	cal/g°C	0.20-0.28
Dielectric stiffness	kV/mm	20-40
Dielectric constant at 60Hz	-	3.2-3.6
Transverset resistivity at 20°C	Ω/cm	>10
Absolute roughness (ka)	mm	0.007
Absolute roughness (Hazen William)	-	150
Manning roughness co-efficient (n)	-	0.009

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Material Classifications

IS 16647:2017 and UNE-EN 17176-2:2019 standards cover several types of PVC-O material, classified according to their MRS (Minimum Required Strength), because Molecular Orientation can be achieved to a greater or lesser extent through different manufacturing processes. Sintex Ultra X PVC-O Pipe is manufactured only in the highest class (PVC-O 500), which offers the highest degree of orientation and thus ensures the best mechanical performance. Subsequently, Sintex Ultra X PVC-O Pipes present higher advantages compared to other materials.

Sintex Ultra X PVC-O 500 Pipe

	PN12.5	PN16	PN20	PN25
Material class	500	500	500	500
MRS (Mpa)	50.0	50.0	50.0	50.0
Nominal Pressure (bar)	12.5	16.0	20.0	25.0
Test pressure over 50 years (bar)	17.5	22.4	28.0	35.0
Test pressure over 10 years (bar)	23.1	28.9	36.7	48.1
Maximum trial pressure onsite (bar)	17.5	21.0	25.0	30.0
Circumferential Stiffiness (KN/m)	≥4	≥4	≥4	≥4
Colour	Shade of Cream/Blue	Shade of Cream/Blue	Shade of Cream/Blue	Shade of Cream/Blue

- With a temperature of 20°C
- According to EN 805:2000 standard with estimated water hammer
- Average stiffness per pipe according to established tolerances
- Available in the shade of cream.
  Should you require other colour options, please contact us

Dimensions

Sintex Ultra X PVC-O 500 Pipe

Nominal Pressure (bar)			PN12.5		PN16		PN20		PN25	
Nominal Diameter (DN)	Outside Diameter (OD)		Inside Diameter (ID)	Wall Thickness C1.4(e)	Inside Diameter (ID)	Wall Thickness C1.4(e)	Inside Diameter (ID)	Wall Thickness C1.4(e)	Inside Diameter (ID)	Wall Thickness C1.4(e)
	min.	max.	average	min.	average	min.	average	min.	average	min.
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
110	110.0	110.4	105.8	2.0	104.5	2.6	103.2	3.2	101.6	4.0
160	160.0	160.5	154.0	2.9	152.3	3.7	150.4	4.6	147.9	5.8
200	200.0	200.6	192.5	3.6	190.4	4.6	188.1	5.7	184.9	7.2
250	250.0	250.8	250.8	4.5	238.0	5.8	235.0	7.2	231.3	9.0
315	315.0	316.0	303.3	5.7	300.1	7.2	296.4	9.0	291.3	11.4
400	400.0	401.2	385.2	7.2	381.0	9.2	376.4	11.4	370.1	14.4

Sintex UltraX PVC-O Pipes are supplied in total length of 6.0 meters (including the length limit mark for the socket).
The inside diameter maybe subject to variations according to manufacturing tolerances as per IS 16647:2017.

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Water Hammers

- Water hammers occur when liquid flowing through piping stops suddenly when a valve is opened or closed, if a pump is stopped or started or by airlocks shifting within the pipe
- Water hammers can result in a higher overpressure than the pipe's working pressure and lead it to breakage
- Sintex PVC-O Pipes have a significantly lower celerity than pipes made from other materials, particularly so with metal piping

Water hammers (P) depend on the celerity (a), which is the wave speed, and the fluid's change of speed (V). The celerity depends basically on the pipe's dimensions (the relationship between the external diameter and the minimum thickness) and the specifications of the material with which the tube is made (Young's modulus, E).

$$P= \frac{a.v}{g}\ ;\ a = \frac{9900}{\sqrt{43.3 + Ke.\ \frac{D_m}{g}}}\ ;\ Ke= \frac{10^{10}}{E}\ ;$$

a: acceleration (wave propagation speed) in m/s, Dm: average pipe diameter in mm, e: pipe thickness in mm, Kc: function co-efficient of the modulus of elasticity (E) of the material of the pipe expressed in KN/m², E: modulus of elasticity in KN/m² for PVC-O Pipe: 4 x 10^6 KN/m².

Handling and Storage

Transportation:

- While transporting different diameters, the biggest diameters must be placed below
- Leave the socket ends free by placing alternating sockets and free ends

Storage:

- Do not drop or throw the pipes on hard or sharp surfaces. If deep scratches to a depth of more than 10% of pipe is found it should be rejected from pressure applications
- Store the pipes horizontally on a flat surface with proper spacing and with supports at every 1.5m to avoid bowing
- Pipes should be stacked in layers with alternate sockets and free ends one over the other so that the socket is not carrying any load
- The pipes should not be stacked above a height of 1.5m as it will bring more load on the pipe which will cause sagging
- To prevent overheating and bowing when stored under direct sunlight, the pipes should be covered with light coloured opaque material that can radiate solar radiation and proper ventilation should also be provided

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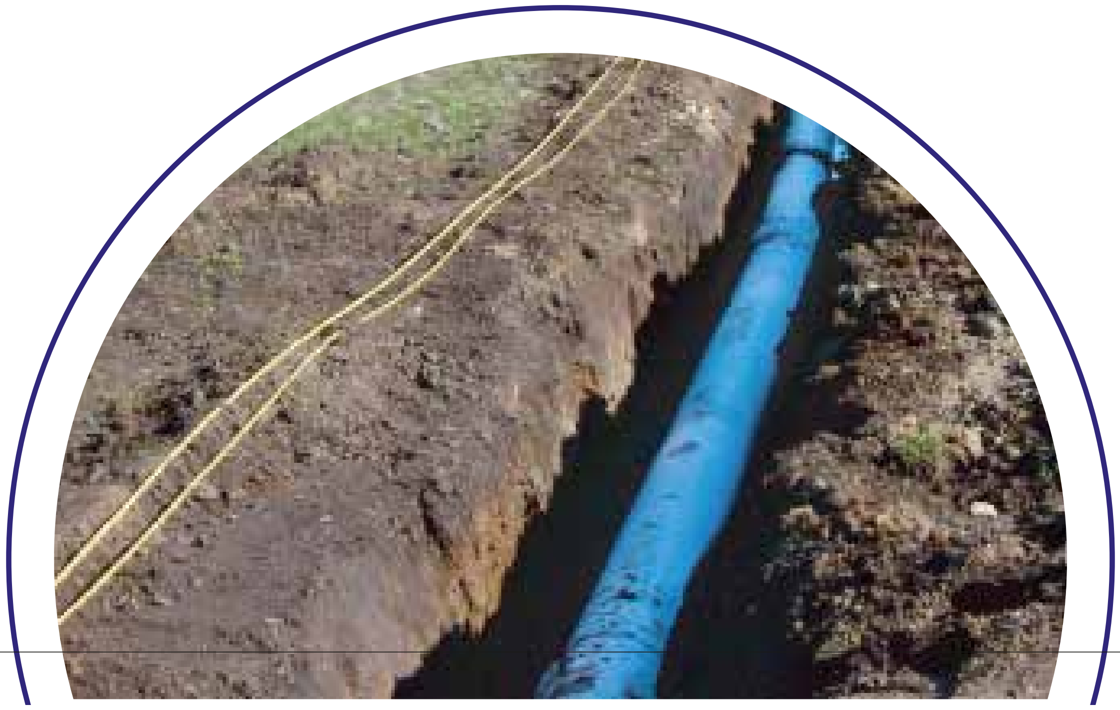
Trenching and Backfilling

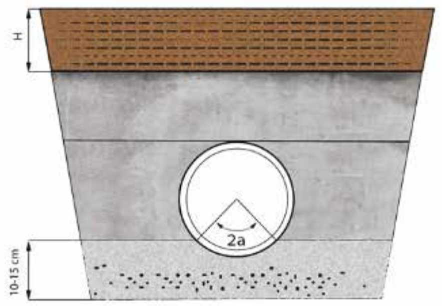
- Trenching should be straight and as narrow as practicable, dimensions of the trench depends on the load to which the pipes will be subjected
- The crown of the pipe should be at a minimum depth of 0.6 meters where there is no road traffic and at a minimum depth of 1 meter where there is road traffic
- Ensure that the bottom of the trench has a uniform support or a sand filling along the entire pipe length
- Clearance holes should be excavated in the bedding for pipe sockets so that the pipeline is supported evenly along the whole length



- Once the pipe is placed, fill the trench with selected material or the same material obtained from excavation and should be compacted properly without large stones or soil clods
- The pipe should not be buried in contact with soil particles sizes larger than 5% of its diameter
- The quality of the embedment material along with its density of native soil and the compaction done will ultimately influence the performance of the pipeline
- Temporary supports like bricks or timber under or in contact with the pipe should be removed before doing backfilling
- If the joints are left uncovered for testing leakage, the backfilling should be done at least to a height of one and half diameter above the pipe so that the pipe doesn't float in the event of rain
- The minimum width of the trench can be calculated using the following table

DN (mm)	Minimum width of trench (m)
110-250	0.60
315	0.85
355	1.00
400	1.10

Depth of trench H (m)	Minimum width of trench (m)
H<1.00	0.60
1.00<H<1.75	0.80
1.75<H<4.00	0.90
H>4.00	1.00



Instructions for Making Joints

SOCKET JOINTING OF PVC-O PIPE

SYSTEMS FOR PRESSURE APPLICATIONS

The recommended jointing procedure is as follows:

Diameter-wise overlapping lengths are respectively, 110mm 2.92%, 160mm - 3.33%, 200mm 3.75%, 250mm - 4.5%, 315mm 5.42%, 400mm - 6.25%

CUTTING PIPES

- If required, pipes can be cut to length on site using either a handsaw or a powered cutting disc
- The ends of the pipe shall be cut cleanly and square to the axis of the pipe
- Ensure that the cut end is then chamfered with an appropriate field tool
- Removal of 25% of the wall thickness at an angle of 10 to 15 degrees
- Leave 10 mm to allow thermal expansion of the pipe, an insertion depth mark should be made on the pipe spigot to match the socket depth
- Collect the residual chips from cutting and dispose of them in a proper way

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CLEAN THE SPIGOT AND SOCKET PRIOR TO JOINTING.

Remove all dust and dirt from the pipe spigot and socket and pay attention to the gasket and the surrounding housing.

APPLY SOAP WATER

- Apply Soap Water/Lubricant to the spigot full covering the circumference up to the insertion depth mark
- Ensure the Soap Water/Lubricant is also applied to the pipe chamfer

ASSEMBLY

- Insert the leading edge of the spigot into the socket mouth
- It is essential that the pipes are aligned and in a straight line before attempting to make the joint

PUSH SPIGOT INTO SOCKET

- A small, longitudinal force applied to the socket end of the pipe is sufficient to insert the spigot into the adjacent pipe socket. Larger diameter pipes may require a crowbar for jointing. In that case, the pipe socket should be protected with a wooden block

- Care must be taken to ensure that the pipe is not under-inserted as this may result in a leaking joint due to the pipe contraction as a result of Poisson's and/or thermal effects. Under-insertion is signified by the insertion depth mark not being pushed up to the end of the socket.
  Note: When pressurized, Poisson contraction will cause shortening of the pipes and this might re-expose the insertion depth mark. This is acceptable

- If a simple insertion past the witness mark has occurred, there is no significant risk to the performance of the joint. Only if the spigot has been forced so hard that it has stressed the transition region at the back of the socket to the barrel of the pipe is there as a cause for concern

- This is generally only a risk with uncontrolled insertion using mechanical equipment like a backhoe or excavator

Field Testing

- On-site testing should be performed according to local regulations and instructions laid down in the projects/standards
- During the assembly, the pipe installed should be tested in sections fully executed (the length may vary between 500 and 1.000 meters).
- The ends of the sections should be closed with appropriate fittings when being tested

Nominal Diameter (DN)	Socket Length (SL)	Maximum Diameter (D max)	Length limit mark for the assembly of the pipes (1)		
			PN12.5	PN16	PN20
mm	mm	mm	mm	mm	mm
110	180	140	163	163	163
160	200	197	178	178	178
200	225	243	198	198	198
250	250	301	222	222	222
315	290	374	254	254	254
400	325	472	282	282	282

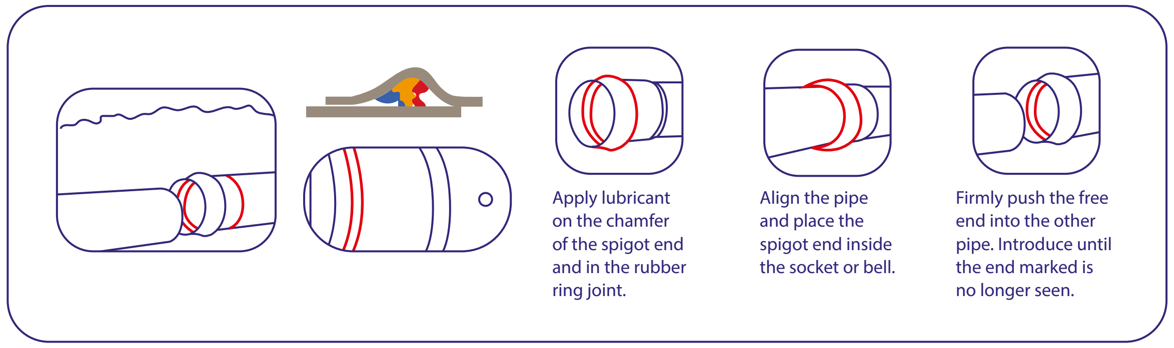
It is recommended to test one of the following methods:

Method A:

- Burying the pipe conveniently with enough compaction to be able to withstand the stresses caused by the pressure of the test, but leaving assemblies uncovered (in some circumstances it is difficult to anchor pipes and fittings, leaving the unions visible)
- Any reductions, changes in direction, junctions and shut-off valves must be properly anchored
- Under these conditions, all pressure and leakage tests can be performed observing the uncovered unions and spot the appearance of leaks

Method B:

- Perform a shallower anchorage of pipes and fittings, leaving assemblies out of any possible problems
- Doing a first leak test by filling the line with water and observe that there are no water losses at the unions (most of the leaks occur at low pressures)
- In case of leaks, the reparation would be easier than with the fully anchored and buried pipes
- If required by local regulations, you could anchor the pipes and accessories conveniently for testing high pressure, keeping the assemblies exposed. If not, you can complete the burial of pipes and fittings with the correct compaction, thus facilitating the necessary anchorage for the high pressure test



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Our vision has always been to deliver water to Indian homes SAAF, SAFE & SAHI.

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- SAFE for your reputation. Solid on responsibility with trust building initiatives–every pipe 100% hydrotested for pressure, 100% inspected for leaks and QR codes on pipes for easy traceability for maintenance

- SAHI, the right choice. With the coming together of three global legacies, Sintex in polymers, Welspun the new Indian conglomerate and Rollepaal's deep knowledge of the industry and technology