

BEST TECH PIPES LLP (Infra Division)

Profiled wall – PP / PE - DWC pipes For Non Pressure - Gravity Drainage & Sewerage -

(To be supplied with Integral non-detachable socket having a minimum ring stiffness of 4
KN/m² when tested individually according to Annexure C of IS-16098 Part I)



DWC



- **Pioneer and the largest manufacturer of PP / PE DWC pipes in the country (since 1997).**
- **1st company to avail BIS certification (IS 16098- part- II) for DWC pipes for Drainage & Sewerage applications in India, Effective from October 2014.**
- **Supplying products across country to almost all the drainage and sewerage Projects.**
- **Current Manufacturing units are located in Maharashtra and Uttarakhand.**
- **Available Stiffness classes: SN 4 , SN 8 & SN 16 .. Sizes upto 800mm ID**

DWC - Most Advanced - Strong- Reliable- Cost effective - Eco Friendly



DWC pipes not only save in materials, labor, Transport cost, and time compared with Conventional material (RCC /Stoneware / PVC pipes /Solid wall HDPE pipes) but also has excellent durability and service life.”



Features / Advantages of DWC- pipes

- **20 times lighter than concrete pipes / 2.5 times more length**
- **Lower & Constant N value / smooth inner surface increases flow velocity- Allows lower sizes to be utilized**
- **Doesn't corrode /Very easy to Transport- joint- handle – Install**

Applications:

- **Sewerage/Storm Water Drainage /Sewerage Treatment Plants (STPs)**
- **City and Urban clusters /Urban Sewerage Rehabilitation**
- **Highway and Busy roads Drainage – Culverts – Pavement & Surface & Sub-Surface Drainage**

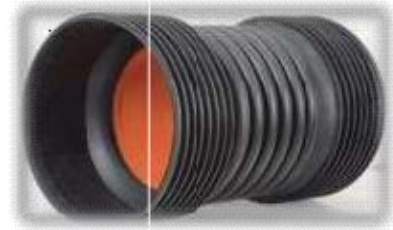
Already Recommended / Approved / Incorporated in DSRs by:

- Ministry of Urban Development / CPHEEO / AMRUT/Smart cities
- Town & Country Planners, NHAI / IRC
- Major Private Township Developers & Builders throughout the country
- Military engineering services (MES)
- All the states /Districts Urban Development Authorities, Municipal Corporation, Development Authorities, Drainage & Sewerage Boards , Smart cities



TECHNICAL SPECIFICATION /REQUIREMENTS

- a. Manufacturer / Group Company have production capability of pipes of sizes 100mm to 800mm ID, Stiffness class: SN 8.
- b. For leak proof Joints “Double Wall Corrugated (DWC) Pipe above 150mm ID (in all the stiffness classes), supplied with Integral non-detachable socket having a minimum ring stiffness of 4 KN/m² when tested individually according to Annexure C of IS-16098 Part I .”
- c. Manufacturer / group company to have at least 3 years’ Experience of production of any type/ specification of Double Wall corrugated (DWC) pipes.
- d. The manufacturer of the pipes to also have valid accreditation under ISO 9001 & ISO 14001.



Recommended Stiffness classes (SN)

- Pipes size- DN ≤ 300 : SN 8 up to 3 meters depth & SN 16 beyond 3 meters depth
- Pipes size - DN > 300 to 500mm ID : SN 16 only - (Any depth)

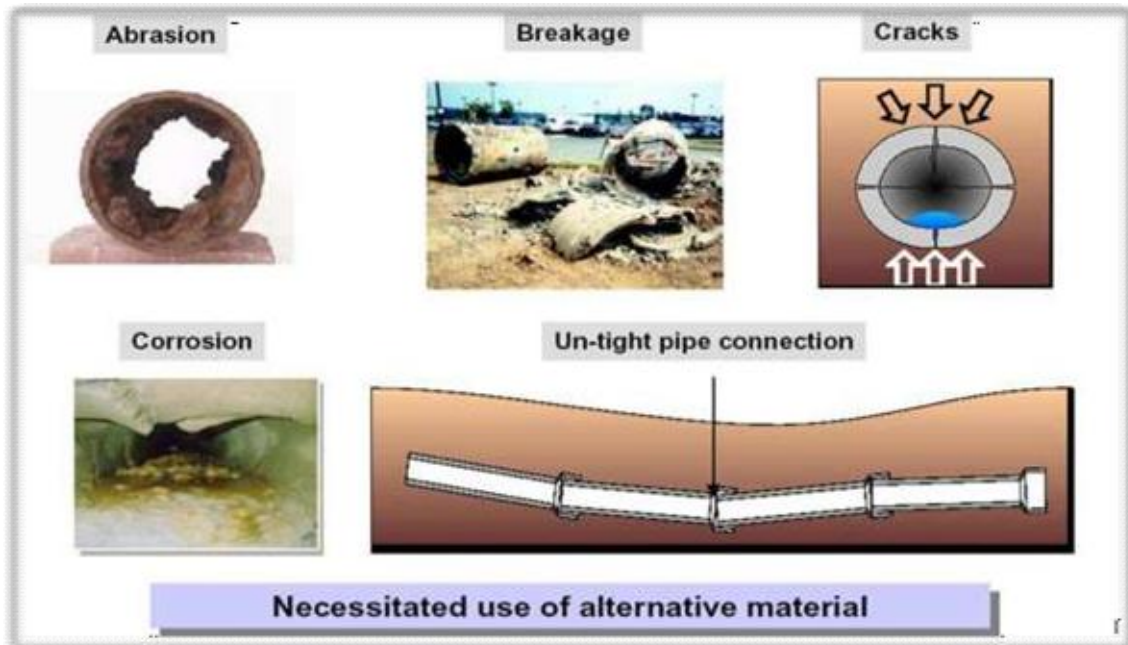
RECOMMENDATIONS / PRECAUTIONS - FOR DWC PIPES:

- Only Pressure Jetting is to be used for cleaning – NO rodding as it will damage the inner wall
- The pipes must be stored under shade /covers to prevent - deterioration from UV / sun light
- Proper training at the site to the contractors staff a must – to be provided by the pipes suppliers
- The depth & width of the trench for various sizes of pipes along with back fill material is given in the standard (IS 16098 PART- II) and it must be followed at the site.
- For proper and leak tight jointing, Pipes of 200 & above sizes to be joined with the help of Jacks only - to be provided by the pipes suppliers. No manual jointing is permitted for ≥200mm sizes.
- The Elastomeric Rings used must be of ISI mark only



Why HDPE / PP DWC Pipes ?

Problems in Conventional Drainage Materials



Problems in Conventional Drainage Materials



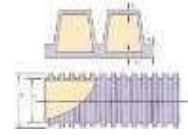
Conventional pipes **can not last as long** as HDPE Corrugated pipes can.

Therefore, engineers are recommending replacement of conventional pipes with HDPE Corrugated Drainage Pipes.

Features / Advantages of DWC pipes:

Life of DWC pipes:- 75 – 100 Years

Detailed studies have been conducted worldwide on the life factor by various experts' agencies. Plastic pipe organization is one of the premier institute in Europe which has declared that the life is at least 75 years.



Structural Design - Strength

HDPE / PP corrugated pipe is a flexible pipe system that performs well in both high cover and low cover applications. Its unique ability to support and distribute live and dead load enables it to meet almost every conditions of installation.



Joints

Silt tight and water tight joints mean that what's inside the pipe stays inside the pipe, and what's outside stays outside.



Durability- Chemical Inertness



High-density polyethylene (Material used in manufacturing of Corrugated pipes) is one of the most chemically inert of all plastics and therefore is extremely chemical and corrosion resistant.

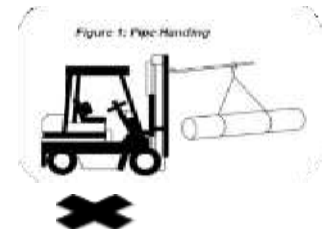
Abrasion Resistance

HDPE/ PP is highly resistant to abrasion. These two characteristics give corrugated polyethylene pipe a significant long-term advantage over conventional pipes.

Handling



Corrugated pipes are light in weight Handling and installation cost is considerably reduced due to light weight feature while long lengths reduces jointing and fitting **cost**



Faster Installation:



Six Meter standard length are easily handled and installed with minimum efforts. Results shows that that DWC pipes can be installed nearly 100% faster than the same diameter of concrete pipes.

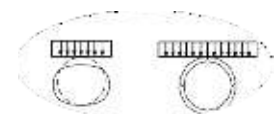
Post Installation :

Once the pipe is laid at a depth of 800mm below the surface or more, practically no load is transferred on the surface of any pipe, irrespective of the facts whether it is a highway load or rail load or aero plane load. This is exactly why the railways have advised use of Double Wall Corrugated (DWC) pipes even for heavy loads such as track crossings.



The pipe soil interaction

Ring deflection of flexible pipes is controlled by the settlement of the soil. After settlement, traffic and other loads do not affect pipe deflection.



SEWAGE CARRYING CALCULATION

HDPE /PP Double Wall Corrugated (DWC) Pipes

SIZES (DN/ ID)	ID IN Mtrs.	A	R ^{2/3}	S ^{1/2}	Q (m ³ /s)	Nearest RCC Pipe
100	0.094	0.00694	0.08204	0.1	0.00633	110 mm
135	0.135	0.01431	0.10444	0.1	0.01661	150 mm
150	0.147	0.01697	0.11054	0.1	0.02084	175 mm
170	0.175	0.02405	0.12416	0.1	0.03318	200 mm
200	0.217	0.03698	0.14331	0.1	0.05889	250 mm
250	0.271	0.05768	0.16619	0.1	0.10651	300 mm
400	0.4	0.12566	0.21544	0.1	0.30082	450 mm
500	0.5	0.19635	0.25	0.1	0.54542	600 mm



*** n Value for DWC Pipe is 0.009**

R.C.C. PIPE

SIZE	ID IN Mtrs.	A	R ^{2/3}	S ^{1/2}	Q (m ³ /s)
100	0.1	0.00785	0.0855	0.1	0.00497
150	0.15	0.01767	0.11204	0.1	0.01467
175	0.175	0.02405	0.12416	0.1	0.02212
200	0.2	0.03142	0.13572	0.1	0.03158
250	0.25	0.04909	0.15749	0.1	0.05727
300	0.3	0.07069	0.17784	0.1	0.09312
450	0.45	0.15904	0.23304	0.1	0.27455
500	0.5	0.19635	0.25	0.1	0.36361



*** n Value for RCC is 0.0135**

Where:

A = cross sectional flow area of the pipe

$$"A = \frac{\pi}{4} * \text{POWER}(\text{ID}^2) "$$

R = hydraulic radius (m), 1/4 the diameter for full-flowing pipe conditions

$$" R = \text{POWER}(D/4) " "$$

S = pipe slope (meter/meter)

$$" S = \text{POWER}(0.01^{1/2}) " "$$

n = Manning "n" (unitless)

Q = Sewer Pipe capacity (m³/s)

$$" Q = A * R * S / n " "$$

INNOVATIONS IN LEAKPROOF JOINTING SYSTEMS



A REFORM IN PP / PE CORRUGATED PIPE JOINTING TECHNOLOGY

In sewage and drainage sector, providing leak-proof joints in structured wall corrugated piping system has always remained a challenging and vital part. The types of jointing patterns followed in the corrugated pipe jointing are rubber gasket with separate coupler and in-line formed bell end sockets. These jointing procedures have certain inherent limitations which have been discussed in this document.



In-Line - Bell End Couplers MUST for all sizes 200 to 800mm ID

Min, load bearing capacity of 4 KN/m²- As per IS IS-16098 Part II, when tested individually.

“Double Wall Corrugated (DWC) Pipe, to be supplied in 6 m length. Pipes should be supplied with Integral non-detachable socket having a minimum ring stiffness of 4 KN/m² when tested individually according to Annexure C of IS-16098 Part I.”

*The test procedure document can be submitted on demand.

• Advantage Polypropylene (PP) DWC pipes :

- Already specified in IS 16098 part 2
- **More –**
- Stiffness, Impact Resistance, Wear Resistance, Shore hardness, Environmental stress Resistance, Compression resistance, abrasion resistance
- Can with stand higher temperatures (more suitable in Indian conditions)
- Prevents use of reprocessed / recycled material (ensure quality)
- Already recommended/ specified /used by many projects/ consultants



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