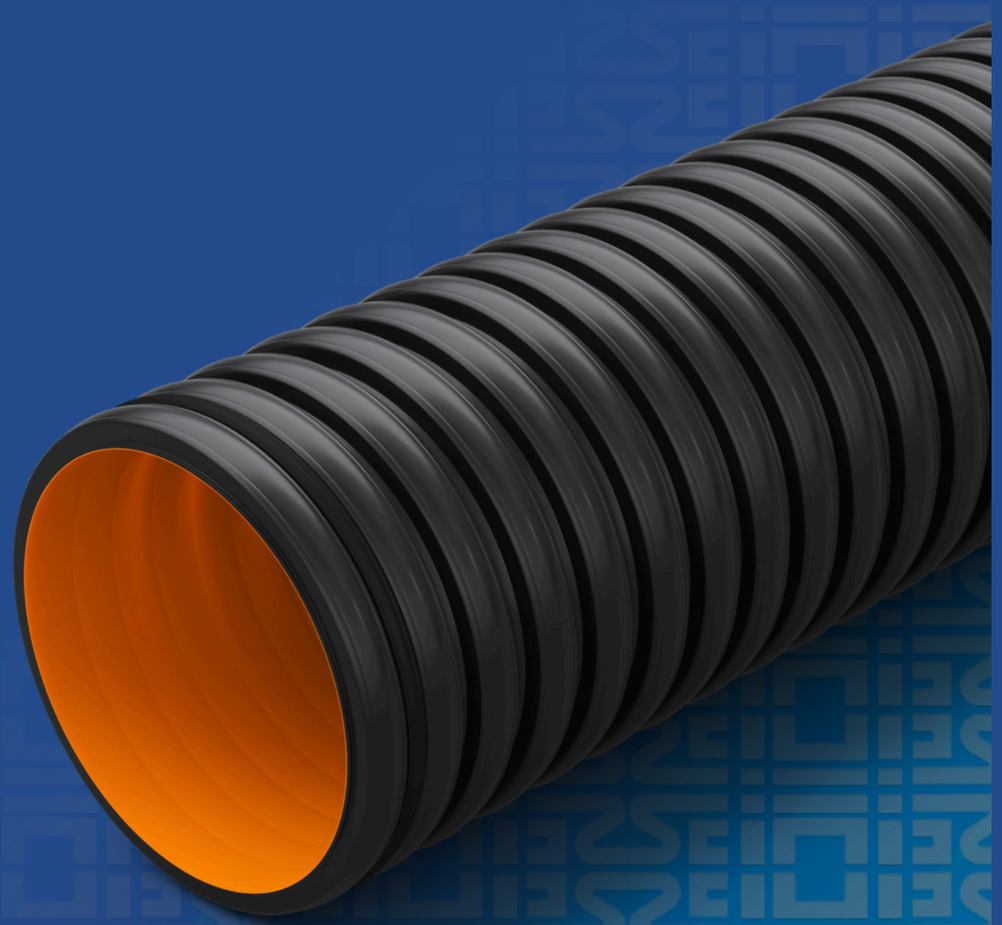
WATER
TECHNOLOGY

DWC HDPE PIPES

WATER
TECHNOLOGY

DWC HDPE
PIPES & FITTINGS



SEIF

WATER
TECHNOLOGY

DWC HDPE PIPES

MADE IN EGYPT

Seif Al Nasr company believes that every drop count. So, the most precious liquid on earth can be transported without wasting a single drop of water.

WATER
TECHNOLOGY

DWC HDPE PIPES

SEIF AL NASR COMPANY PROFILE

FOR PLASTIC PIPES

SEIF AL NASR company is considered one of the leading pipes manufacturers in the Egyptian plastic market, which was established in 2004 in Borg Al Arab (Alexandria), to meet the increases demand for high quality plastic products in both local and regional markets. our latest factory in the 10th of Ramadan, Cairo is equipped with the most up-to-date machinery and equipment in Egypt. which produces 240,000 Tons of plastic materials annually. for the Double wall corrugated pipes & fittings, we are offering a wide range according to the global Standards. Seif Al Nasr company offers a wide range for the DWC pipes Inner diameters from 100 mm up to 1000 mm, and different ring stiffness starting from SN4 up to SN8 according to the EN-13476-3. the stiffness is requested either from the consultants or designed by SEIF Al Nasr engineers.

SEIF Partners

ECG Engineering Consultants Group S.A. · Marafie Consult · EHAF Consulting Engineers · SODIC · SHAKER Consultancy Company · Beit El Khebra بيت الخبرة · Palm Hills Developments · EMAAR · SAMCRETE · dar · ORASCOM Construction · GAMA Construction · SWANLAKE Katameya · ROWAD Modern Engineering · INERTIA · CONCORD Building Sustainable Development · JULIUS BERGER International · Stantec · TALAAT-IMAM Consulting Engineers · ALMARASEM Development · TMG · المقاولون العرب · ÖKOPLAN Engineering Consultations · New City Alamein · PETROJET · Concrete PLUS · هيئة المجتمعات العمرانية · KASED KHAIR General Supplies and Contracting · وزارة الإسكان والمرافق والمجتمعات العمرانية Ministry of Housing, Utilities & Urban Communities · CPM Consultancy · SEECO · سابك sabic · Hassan Allam Holding · Badyā · بروج Borouge · NAMAA · الجهاز المركزي للتعمير Central Agency For Reconstruction · ARAS Consulting Engineers · GIECO · Chemonics Development works here.

Technical Guide

STD [EN13476/DIN16961]

Specifications for Polyethylene (PE) pipes with profiled, double wall pipes with outside corrugated and inside smooth surface

Raw Material Partners

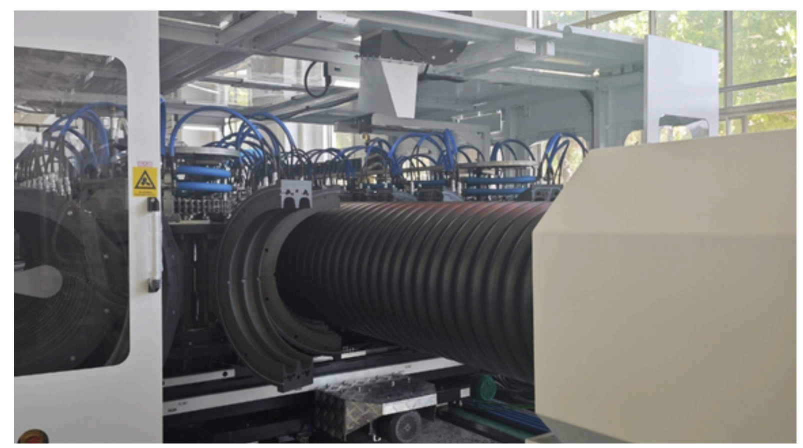
بروج Borouge · سابك sabic · TASNEE التصنيع · lyondellbasell

Raw Material High Modulus of Elasticity PE

Polyethylene is thermoplastics with excellent properties for the application of water and sewer, as well as for the fabrication of containers for liquids and solid materials.

Physical a Mechanical Properties of Material

Properties	T.Value
Density	0.960kg/m³
Modulus Of Elasticity	1100 mpa
Elongation	>600 %
Thermal stability - Oxidation induction	>20 min
Color	Black/Orange



About Double Wall Corrugated Pipes

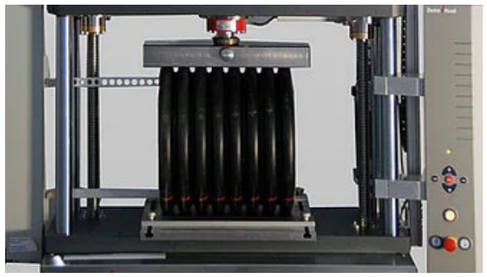
Ring Stiffness

SEIF Al Nasr DWC pipes has a Ring stiffness that can be defined as its ability to resist radial forces acting on it and the pipes resistance to ring deflection and structural damage. Buried pipes such as sewer and water pipes are subjected to soil pressure, hydrostatic pressure and live loads from traffic. SN4 is a pipe class for light and medium traffic load and SN8 is a pipe class for heavy traffic load according to EN ISO 9969, Thermoplastics pipes - Determination of ring stiffness.

According to the EN 13476-3 standard the sewerage pipes resistance to external load-ring stiffness (SN) is of great importance. The pipe resistance is a feature characteristic for elastic pipes and represents a relation between geometric data and material characteristics.

Technically, the pipe's ring stiffness is defined as:

$$SN = EI / Dm^3$$



Where:

E – module of elasticity, in Pa
Dm – mean pipe diameter, in m
I – moment of inertia, in m4/m

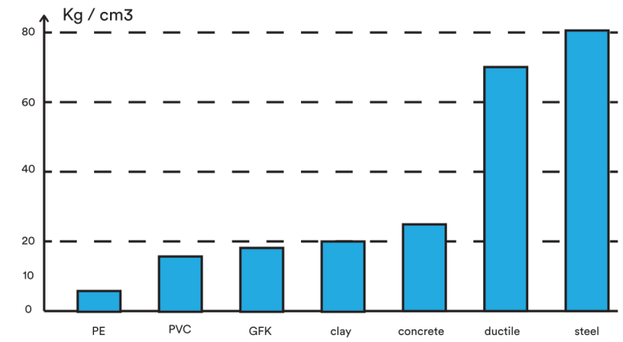
Standard pipe classes according to ISO9969 have ring stiffness of SN 4,8 and 12 KN/m2.

SEIF DWC pipes Applications:

- Underground drainage and sewer application
- Disposal of industrial effluents Stormwater
- drainage Rainwater harvesting and
- groundwater recharge Road/highway cross drainage

SEIF DWC pipes Advantages:

- Anti-corrosion
- resistant to micro organisms
- UV Resistance
- ECO friendly
- 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
- Excellent Stiffness
- Easy & quick installation
- Long life Pipe



Comparison Between DWC - Solid wall PIPES

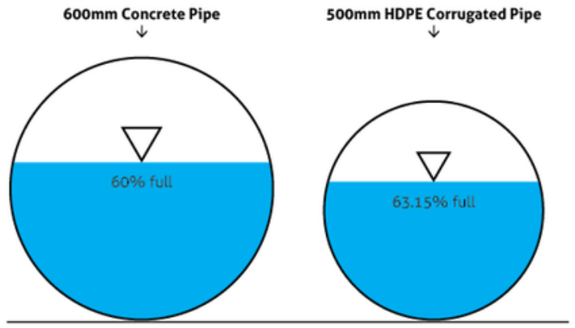
DWC -VS- Plastic Pipes

DWC-PIPES	Solid Wall – Plastic PIPES
D Light Duty It saves about 60- 70 % of the Material Based On Ring Stiffness Concept	Heavy Duty In Compared With DWC

Comparison between DWC -VS- Concrete Pipes

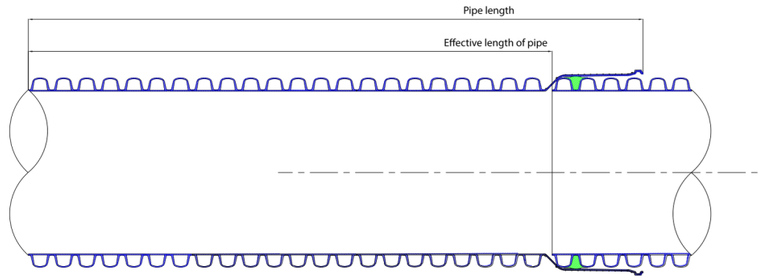
Parameters	HDPE Corrugated Pipes	Concrete pipes
chemical corrosion	High chemical and corrosion resistance.	Susceptible to damage from harsh chemicals and corrosion.
Material property	Flexible pipe	Rigid pipe
Weight	Very light	Heavy (19-20 times heavy than DWC pipes)
Roughness Coefficient of Pipes	0.009 Much higher flow rate due to less roughness coefficient	0.014 Lesser flow rate
Handling	Easy due to its lightweight	Difficult due to its heavy weight
Lifetime	More than 50 years	Around 15-20 years

PIPES DN 1.200	CAPACITY Q [l/sec.]	FULL capacity speed	V [m/sec.] HDPE Corrugated
DN = d.e. (d.i. = 1030 mm)	1350	77%	1,95
CONCRETE (d.i.)	1350	71%	1,57

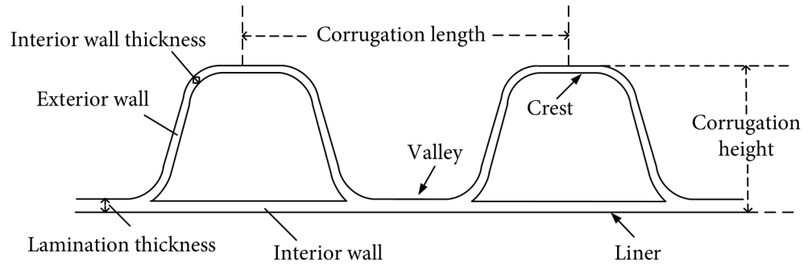


Pipe Dimensions Table

According to DIN 16961 and EN 13476 Profile Design



Nominal size ID (MM)	Approximate inner diameter	Approximate outside diameter	stiffness class SN (kN/m2)	total pipe length	effective length	socket length
100	97	114	SN4-SN8	6496	6403	93
150	147	171	SN4-SN8	6467	6348	119
200	197	231	SN4-SN8	6439	6281	158
225	222	258	SN4-SN8	6439	6282	157
250	248	289	SN4-SN8	6433	6261	172
300	297	347	SN4-SN8	6403	6187	216
350	347	406	SN4-SN8	6384	6184	200
400	395	462	SN4-SN8	6356	6120	236
450	446	519	SN4-SN8	6357	6124	233
500	494	577	SN4-SN8	6321	6034	287
600	592	692	SN4-SN8	6277	5901	376
700	692	808	SN4-SN8	6273	5909	364
800	790	926	SN4-SN8	6178	5684	494
900	890	1040	SN4-SN8	6167	5691	476
1000	990	1154	SN4-SN8	6174	5699	475

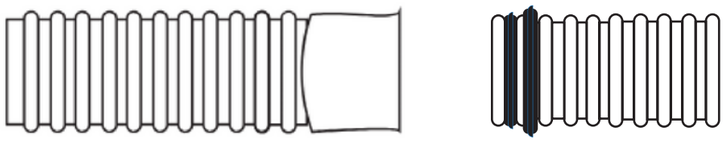


Jointing

It is recommended that one always lay pipe starting at the down stream end, pushing spigots into the socket with the socket facing upstream. Always push spigot ends into the socket, not socket end into the spigot

1- Begin by inspecting the socket and remove any foreign matter. use a clean rag or brush to lubricate bell of pipe lubricant. Clean spigot end of the pipe

2- Remove protective wrap from gasket Using clean rag or brush, lubricate the exposed gasket with pipe lubricant. Do not allow lubricated section to touch dirt or backfill. Foreign matter could adhere to the surface and compromise joint integrity. Place spigot into the socket and align.



Transportation, Handling & Storage

Double Wall Corrugated Pipes are Affected in Particular by any Variation of the Following:

- trench width
- trench depth
- degree of compaction of the embedment
- degree of compaction of the main backfill
- pipe support and trench bottom conditions
- construction traffic and temporary loads
- soil types and soil parameters (e. g. subsoil. trench walls, backfill)
- ground and soil condition (e. g. frost and thaw, rain, snow, flooding)
- groundwater table
- additional pipelines in the same trench

Excavation Trench Preparing According to Egyptian Code

- The trench must be prepared by having sand bedding layer at the bottom of the pipe.
- Reduces the loads above the pipes
- To prevent the pipe movement in the direction of the water flow so as not to be subjected to be broken, bending, deflated
- Pipes protection against any external broken as a result to the rocks and sharpy elements
-Under pipes Bedding thickness = 1/3 x OD (pipes)

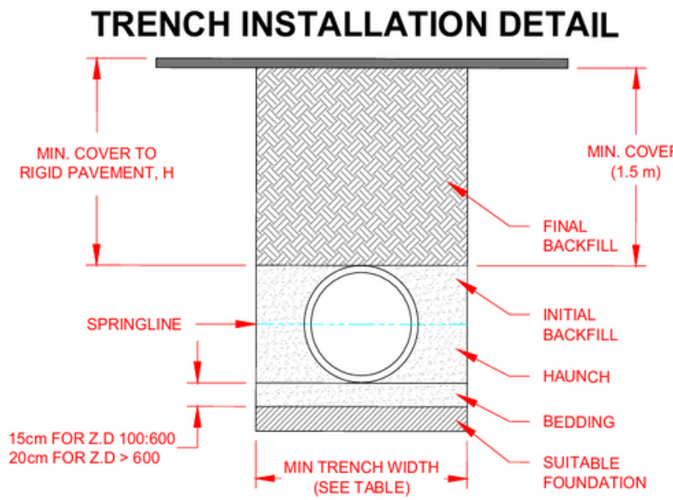
1- Bedding heights above the pipes

Road Type	The minimum Depth m
Traffic	1.2
Side	0.9
Other destination	0.6
agriculture / Farms	0.45

The minimum Bedding Layer under the pipes must be 15 cm in case rocky soil at least 30 cm with sand layer

2- Excavation Width

Pipes OD MM	The minimum Width Per Each Side
<315	30 cm
≥ 315	40 cm



Quality Assurance

Quality Tests

- Ring Flexibility
- Oxidation Induction
- Time Test Impact Test
- Melt Flow Index Test
- Ring Stiffness Creep
- Ratio Physical
- Properties Water
- Tightness Test Effect on
- Heating

Testing

Procedures and requirements for testing gravity pipelines
EN1610

Testing for leak tightness of pipelines and inspection chambers shall be conducted either with air (method “l”) or water (method “W”)

Initial testing may be applied before any side fill is placed. For final acceptance the line shall be tested after backfilling and removal of sheeting choice of testing by air or water may be given by the specifier.

If groundwater level is present, above the crown of the pipeline during testing, an infiltration test may be applied with individual specification

Testing With Air Method L

The testing times for pipelines excluding manholes and inspection chambers are given in table 3 in relation to pipe size and testing methods (LA; LB; LC; LD).

NOTE 1: An initial pressure approximately 10 % in excess of the required test pressure, P0 , shall first be held for approximately 5 min. The pressure shall then be adjusted to the test pressure shown in table 3 related to testing method LA, LB, LC or LD. If the pressure drop measured after the testing time is less than Δ given in table 3 then the pipeline complies.

Testing Method	P_0 kPa	ΔP kPa	Testing Time Min						
			DN100	DN200	DN300	DN400	DN600	DN800	DN1000
LA	10 (1)	25.5 (0.25)	5	5	7	10	14	19	24
LB	50 (5)	10 (1)	4	4	6	7	11	15	19
LC	100 (10)	15 (1.5)	3	3	4	5	8	11	14
LD	200 (20)	15 (1.5)	1.5	1.5	2	2.5	4	5	7
K_p-Values			0.058	0.058	0.04	0.03	0.02	0.015	0.012

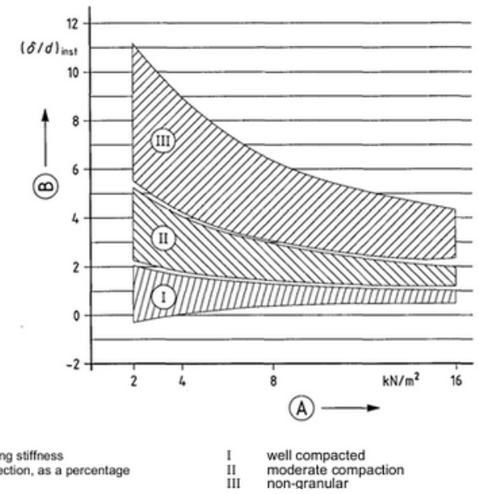
$$t = \frac{1}{K_p} \; X \; \frac{P_0}{P_0 - \Delta P} \qquad K_p = \frac{12}{DN}$$

With t rounded to the nearest 0,5 minute
when t ≤ 5 min, to the nearest minute when t > 5 min.

Table 3: Test pressure, pressure drop and testing times for testing with air

Soil Stiffness

For the design of a system of flexible pipes in the stiffness range of 2 kN/m2 to 16 kN/m2 use is made of the graph in Figure 3. On the vertical axis, the pipe deflection is shown and at the horizontal the pipe stiffness classes. For each installation group (as defined in ENV 1046 [8] into well, moderate and none and described in Annex C) an area is given in which the deflection after installation is expected. The upper edge of the area represents the maximum deflection to be expected. The lower edge of the area shows the average deflection to be expected.



Key
A nominal ring stiffness
B initial deflection, as a percentage
I well compacted
II moderate compaction
III non-granular

The graph is applicable when the following conditions are fulfilled.

Table 10 — Application of the design graph; checking pipe installations within this design graph fulfils 4.2 of EN 1610:1997 [13]

Parameter	Value (range)	Remark
Installed depth	0,80 m to 6,0 m	Cover depth to crown
Soils	Granular-cohesive	
Installation type	Well, moderate, none	Combination of soil, compaction, and degree of care
Pipe stiffness, SN (EI/D^3)	≥ 2 kN/m²	
Pipe types, structured and solid wall	Solid wall pipes Structured wall pipes fulfilling the 30 % ring flexibility test	Also applies to solid wall pressure pipes
Traffic load	all cases	
Diameter	≤ 1 100 mm	
Depth of cover / diameter ratio	≥ 2	
Ground water table	No limitation	
NOTE 1 National calculation methods and regulations might put additional limitations. See therefore the national foreword. NOTE 2 Pipe stiffness less than 4 kN/m² is sometimes used for pipes with diameters bigger then 800 mm.		