



PARS ETHYLENE KISH CO.
WE TAKE CARE ABOUT THE FUTURE

Call Us : (+98 21) 88 20 20 60

Sewage and rainwater

Experience the leading GIGAPIPE System!



GIGAPIPE System

PP-System SN8

DN/ID 150 mm – DN/ID 1000 mm

 **made
in
Germany**

www.parsethylene.com
www.parsethylene-kish.com

 **PARS ETHYLENE KISH**
Manufacturers of HDPE pipe and Fittings

 **DROSSBACH**
Corrugated Pipe Solutions

(+98 - 21) 88 20 20 60
info@parsethylene-kish.com

DROSSBACH corrugated GIGAPIPE Systems**Lighter, more solid and truly higher quality!**

The innovative approach, Corrugated Pipe Solutions offered by DROSSBACH, is a contribution to solve the water problems caused by the fast increasing world population and the consequences of the global warming. Over the last decades DROSSBACH has gained experience in development and production of intelligent pipe systems and has thereby accumulated competence to present process optimised machines and pipe business orientated services. These are some of the established fundamentals of the successful cooperation with partners worldwide.

The consequences of the global warming, the further industrialisation, the strong increasing tourism and the progressive agglomeration are issues that require immediate efforts, while on the other hand these circumstances establish at the same time excellent chances.

Invest in the growth markets of today for tomorrow:

With DROSSBACH, the partner for sewage and rainwater drainage systems!

*»The DROSSBACH GIGAPIPE System
offers me leading pipe technology with unbeatable
advantages in quality lifetime and profitability.«*





CORRUGATED PIPE SOLUTIONS

• WIN-WIN PARTNERSHIP

• AFTER SALES
SERVICE

• ENGINEERING

• MACHINERY



• WATER-
MANAGEMENT

• CONSULTING

• MARKETING

• PIPE SYSTEMS



GIGAPIPE System

All GIGAPIPE pipes are produced with DROSSBACH's own corrugated plastic pipe machines of the HD series. Customers profit from the know-how of innovations and technology of DROSSBACH, especially in the production of large pipes, and benefit from the durable, quality-controlled GIGAPIPE pipes with their improved corrugated pipe technology.

TECHNICAL HIGHLIGHTS:

- ▶ Complete sewage and rainwater system with full fitting and shaft program from ID 150 mm up to ID 1000 mm
- ▶ Long-term tightness by SAFECONNEC
- ▶ Optimised pipe design for highly secure and flexible pipes
- ▶ Double wall pipe made of PP – high chemical resistance
- ▶ Long life time of approximately 75 until 100 years
- ▶ Resistant to high pressure jet cleaning systems (180 bar)
- ▶ Excellent hydraulic properties due to $K_D = 0,25 \text{ mm}$
- ▶ No incrustation

DROSSBACH GIGAPIPE Systems

DIN EN 13476: 2007-08!

AVAILABLE PIPE SIZES (DN/ID):



1. AREAS OF USE

- ▶ Sewerage
- ▶ Rainwater drainage
- ▶ Sewage and mixed water channels
- ▶ Various special solutions for industry and business
- ▶ Ground drainage
- ▶ Domestic drainage

2. STANDARDS

- ▶ The material PP guarantees high modules of elasticity (Young's) and ring stiffness of SN 8 following DIN EN ISO 9969
- ▶ Profiled wall range 5 following DIN 16961 $\geq 31.5 \text{ kN/m}^2$
- ▶ Authorisation based on DIN 16961, DIN 19357 and DIN EN 13476
- ▶ Suitable for all bedding materials following DIN EN 1610
- ▶ Suitable for all normal pressure tests following DIN EN 1610

3. TRADEMARK

- ▶ GIGAPIPE

4. MATERIAL

- ▶ Pipes and moulded parts made of polypropylene (PP)

5. Quality Requirements

- ▶ General technical approval from the Deutsches Institute für Bautechnik (DIBt) in Berlin. DIBt Z-42.1-390

6. CHEMICAL RESISTANCE

- ▶ DIN 8061, leaflet 1
- ▶ The pipes and moulded parts as well as sealing elements have a chemical resistance between pH 2 (acid) and 12 (alkaline).
- ▶ GIGAPIPE is resistant to all sewage and ground substances following DIN 1986.

7. THERMAL STRESS

- ▶ GIGAPIPE pipes and moulded parts made of PP are used to channel sewage and rain water. The requirements of DIN EN 476 concerning the long-term temperature stress levels must be met: up to DN 150 +45°C and +35°C for larger measurements. The temperature ranges are between -25°C and +60°C.

8. COLOUR

- ▶ Black profile
- ▶ RAL turquoise blue inside (best colour for cameras)

9. IDENTIFICATION

- ▶ Pipe Identification following DIN EN 13476

10. NOMINAL MEASUREMENTS (DN)

- ▶ Measurements in mm ID range = interior measurements or nominal measurements: 150, 200, 250, 300, 400, 500, 600, 800, 1000

11. LENGTHS

- ▶ Standard length without in-line belling joint: 6000 mm
- ▶ Special lengths available on request

12. MARKINGS

- ▶ GIGAPIPE systems have co-extruded markings. These show which type of drainage pipe has been laid.
- ▶ Red – sewage and mixed water drain
- ▶ Blue – rainwater drain
- ▶ The co-extrusion process ensures durable markings.

13. ROOT RESISTANCE

- ▶ Tests following DIN 19537-2/DIN EN 681 prove the water tightness and root resistance

14. RECYCLING

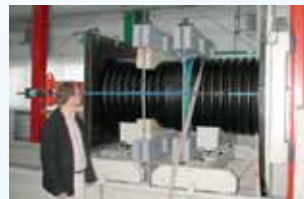
- ▶ Almost all thermoplastics, which include PP, can be ground to form granules for processing new products.

**Lighter**

GIGAPIPE corrugated plastic pipes are lighter and at the same time more solid than common rigid pipes due to an improved corrugated pipe technology, developed at the DROSSBACH Innovation Centre. The exceptional light-weight GIGAPIPE is the result of less material used compared with smooth plastic pipes.

**More solid**

Due to the remarkable elasticity and ring stiffness of the innovative corrugated pipe profile. GIGAPIPE corrugated plastic pipes are more resilient than regular pipes.

**Long-term tightness**

DROSSBACH developed a special socket technology which ensures a short-term tightness of 2.5 bars and a long-term tightness for your reliability.

SAFECONNEC:**Innovative technology to secure long-term tightness.**

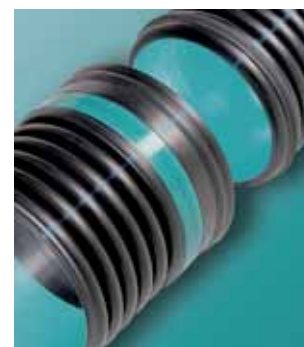
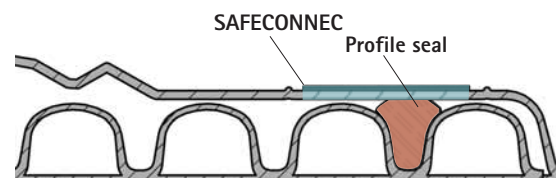
The secret of the superior long-term water tightness of all DROSSBACH plastic pipes is the innovative SAFECONNEC technology. It reinforces the plastic pipe joints at the most important and critical points to ensure the outstanding long-term resistance and tightness. Moreover an extraordinary strengthening process ensures the necessary long-term resistance of the joint against deformation and leaks with an externally welded reinforcement ring.

It holds!

SAFECONNEC reinforces the critical points on plastic belling joints to ensure a long-term watertight connection. The wrapper technology, a reinforcement process, provides the required permanent seal via a highly rigid reinforcement band welded to the pipe.

Highlights

- ▶ Long-lasting watertight in-line belling joint
- ▶ Fulfils the latest standard (e.g. DIN EN 13476 Part 1-3)
- ▶ Insoluble special strengthening band welded onto external surface to eliminate typical long-term creeping of plastics
- ▶ In-line belling joint so no trough required

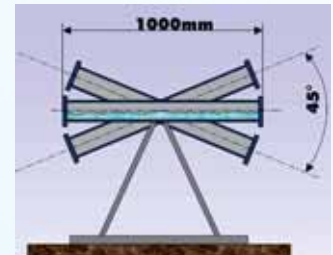
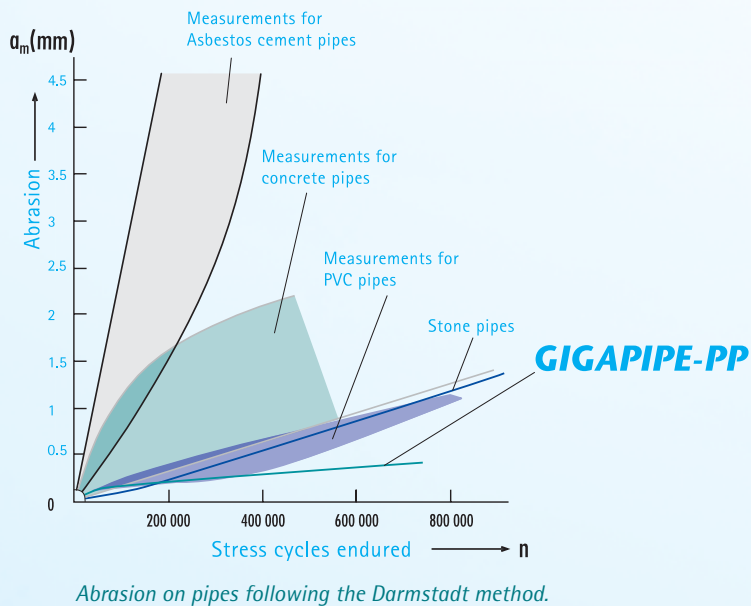


The advanced wrapper technology for long life water tightness.



DROSSBACH GIGAPIPE Systems

Best abrasion values with PP!



Silica sand/gravel/water
with 45% silica sand/gravel
particle size 0-30mm

Application and areas of use

The construction of the pipe walls and the material PP guarantees a perfect balance of ring stiffness and ring flexibility. The static verification comes from examples of static calculations. The GIGAPIPE system can therefore be used where traffic load is high. In the area of HLC 60, values were determined which allowed problem-free laying of GIGAPIPE with low coverage of e.g. 0.5 m and high coverage of e.g. 6 m. Should an individual static verification be required DROSSBACH provides this through a static calculation.

- ▶ Sewerage
- ▶ Rainwater drainage
- ▶ Sewage and mixed water channels
- ▶ Various special solutions for industry and business
- ▶ Ground drainage
- ▶ Domestic drainage

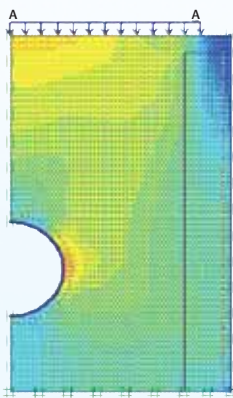
Abrasion behaviour

The abrasion behaviour of GIGAPIPE pipes has been tested in comparison to pipes made of other materials following the Darmstadt method. The results of this test have been, that sewage pipes made of plastic or PP always have the lowest abrasion values. PP especially has best abrasion values.

DROSSBACH GIGAPIPE Systems

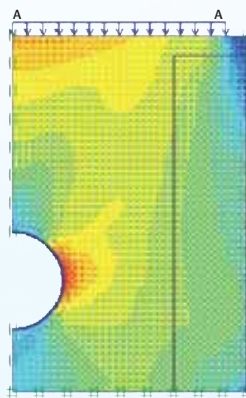
**Various applications, top abrasion values
and durable ring flexibility!**

D_{pr} 92%



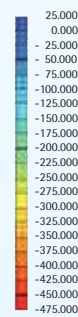
Effective mean stresses
Extreme effective mean
stress $-366,09 \text{ kN/m}^2$

D_{pr} 99%



Effective mean stresses
Extreme effective mean
stress $-463,64 \text{ kN/m}^2$

(kN/m^2)



Low tension in the ground

--> Low vertical stress above the pipe

High tension in the ground

--> Pipe is supported sidewise by the ground

Ring Flexibility

The relaxation capacity of GIGAPIPE in sewage systems means that when under pressure, e.g. through wrong loads caused by movement or ground slippage, the pipes remain elastic and stay in shape. The load is carried back to the ground. Should this deformation occur over a longer period the tension in the pipe relaxes until there is virtually no tension left. Rigid pipes, on the other hand, take on the load and cracks begin to appear which can lead to a not functioning pipe at all.

Difference between resistant to bending and flexible pipes:



Resistant to bending:

All loads (static and dynamic) carried by the pipe.

Flexible pipes:

All loads carried by the soil around the pipe, pipe is stress less.



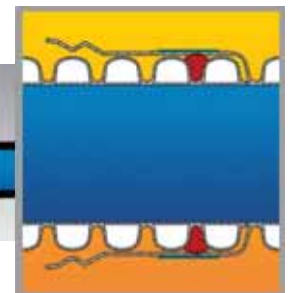
DROSSBACH GIGAPIPE Systems

Water tightness, approved under tough conditions!

Water tightness of pipes, moulded parts and connections:

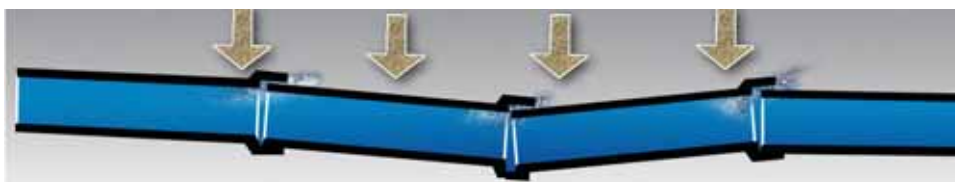
- ▶ **Water tightness with internal pressure**
- ▶ **Pipes and moulded parts:**
All tested pipes and moulded parts must be watertight.
- ▶ **Bent pipes:**
All connections on bent pipes must be long-term watertight under internal excess pressure from water of min 0.5 bars and also have to be short-term watertight with an internal pressure of 2.5 bars.
- ▶ **Deformed pipes:**
All connections on deformed pipes must be long-term watertight under internal excess pressure from water of min 0.5 bars and also have to be short-term watertight with an internal pressure of 2.5 bars.
- ▶ **Bent and deformed pipes:**
All pipe connections must be watertight.

Flexible pipe: deformed especially in the pipe shaft



The drawing shows that flexible pipes adapt to uneven ground or displacement. The GIGAPIPE system remain undamaged – the system remains tight.

Rigid pipes: the pipe joints do not bend



Rigid pipes react to uneven ground or displacement as a whole pipe. The lack of flexibility together with a relatively small socket can lead to leaks.

DROSSBACH GIGAPIPE Systems

Hydraulic behaviour at its best!

The pipe wall roughness of GIGAPIPE, like all plastic pipes due to their very smooth pore-free internal surface, is between 0.005 and 0.05 mm. The influence of connections, diversions, shafts etc must be taken as a correction value in the regulatory roughness calculation k_b for streaming technology. Comprehensive information about this can be found in the datasheet ATV-DVWK-A 110 "Hydraulische Dimensionierung und Leistungsnachweis von Regenabwasserkanälen und -leitungen" (hydraulic dimensions and performance of rainwater channels and pipes) (3rd edition 09/2001). The flow amounts for GIGAPIPE for a roughness value of 0.25 mm corresponding to the ATV-A 241 requirement for e.g. transport channels with shafts can be seen below.

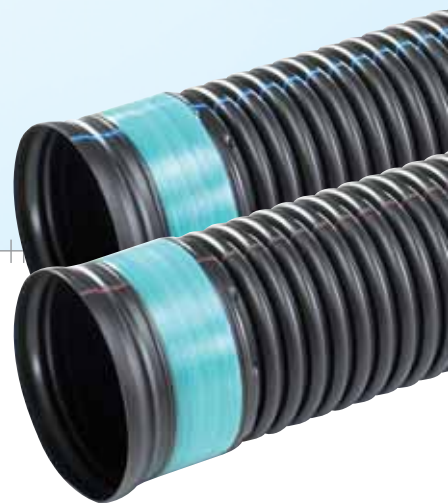
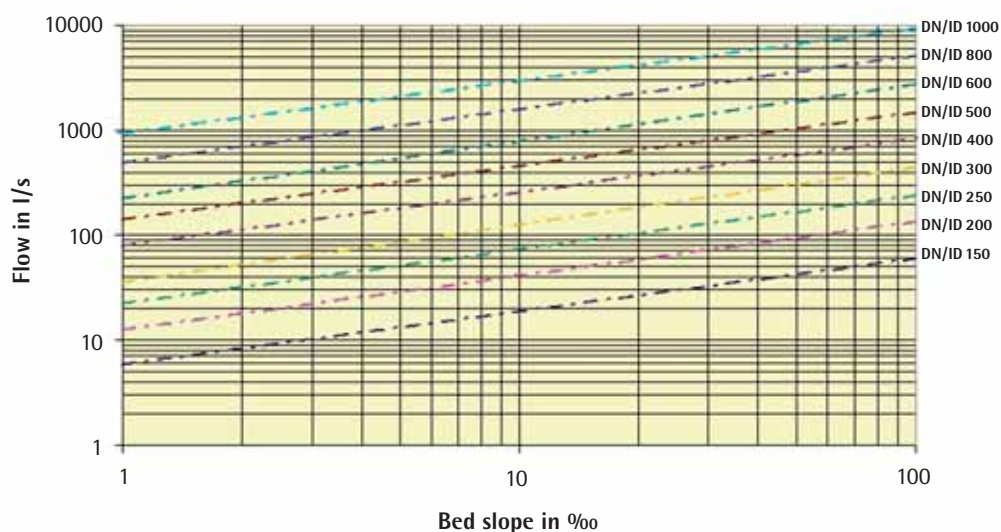


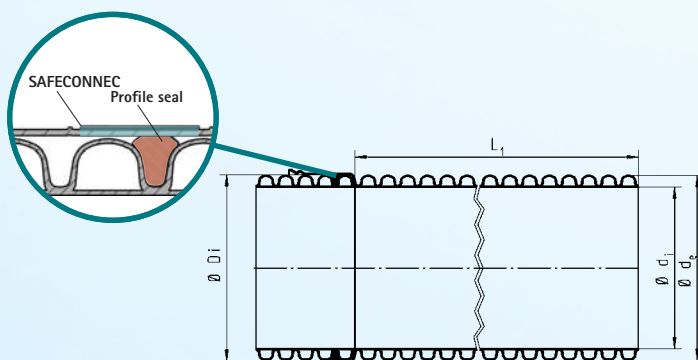
Diagram of flow amounts for Gigapipe pipes for $k_b = 0,25 \text{ mm}$



DROSSBACH GIGAPIPE Systems

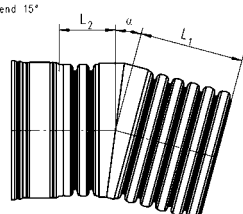
Technical Details of the system parts!

Drossbach offers the complete sewage and rainwater system with a full fitting and shaft program from ID 150 mm up to ID 1000 mm, which is shown beneath. Due to the secure and fast installation of all different system parts, construction times can be reduced to a minimum and costs can be saved.



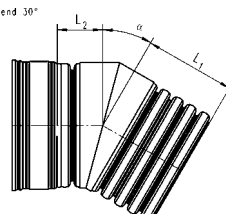
DN/ID	Ø d _e	Ø d _i	Ø Di	L ₁
150	168,6	147,5	169,8	6180
200	225,7	197,5	227,3	6154
250	282,9	247,5	284,9	6149
300	340,0	296,6	342,4	6137
400	452,6	395,0	455,8	6076
500	565,7	495,0	569,7	6046
600	678,9	594,0	683,7	6002
800	906,3	793,0	912,7	5968
1000	1134,3	992,5	1143,7	5875

↘ Bend 15°



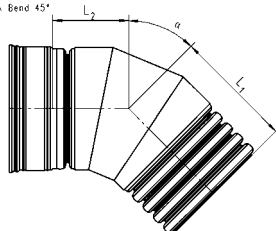
DN/ID	150	200	250	300	400	500	600	800	1000
L ₁	196	207	247	310	358	393	517	531	786
L ₂	113	152	148	186	193	210	308	336	542

↘ Bend 30°



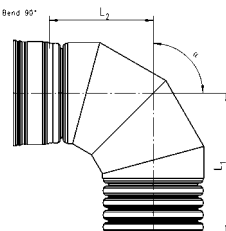
DN/ID	150	200	250	300	400	500	600	800	1000
L ₁	186	193	263	289	440	419	545	673	839
L ₂	103	138	164	166	275	237	336	478	473

↘ Bend 45°

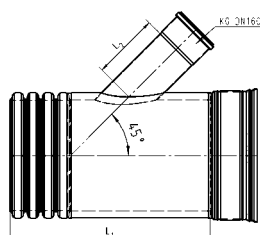


DN/ID	150	200	250	300	400	500	600	800	1000
L ₁	242	295	354	465	565	580	658	920	1227
L ₂	160	212	255	300	400	337	449	637	861

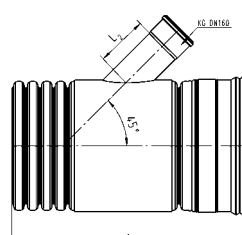
↘ Bend 90°



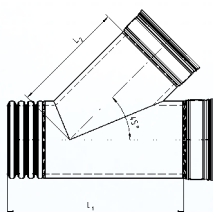
DN/ID	150	200	250	300	400	500	600	800	1000
L ₁	356	447	564	670	764	817	920	1213	1635
L ₂	273	364	432	546	599	634	710	1030	1268



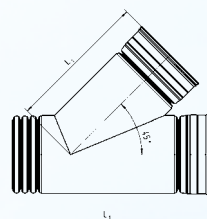
DN/ID	150	200	250	300	400
L ₁	444	568	628	731	720
L ₂	300	300	300	300	300



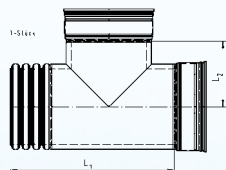
DN/ID	500	600	800	1000
L ₁	1030	1220	1462	1856
L ₂	300	400	400	400



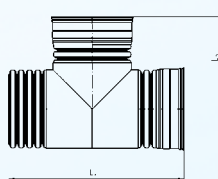
DN/ID	150	200	250	300	400
L ₁	444	658	747	878	1026
L ₂	250	372	438	549	663



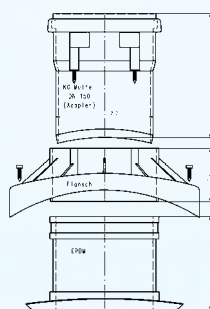
DN/ID	500	600	800	1000
L ₁	1642	1847	2339	3075
L ₂	888	1009	1365	1767



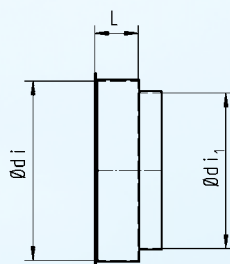
DN/ID	150	200	250	300	400
L ₁	521	567	628	731	865
L ₂	257	213	240	298	345



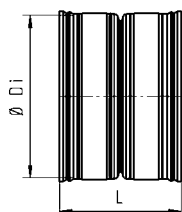
DN/ID	500	600	800	1000
L ₁	1398	1569	2047	2588
L ₂	487	592	780	975



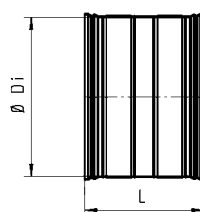
DN/ID	D ₁	L ₁	L ₂	L ₃
250	160,8	205,9	88,0	155,0
300	160,8	205,9	88,0	155,0
400	160,8	205,9	88,0	155,0
500	160,8	205,9	88,0	155,0
600	160,8	205,9	88,0	155,0
800	160,8	205,9	88,0	155,0
1000	160,8	205,9	88,0	155,0



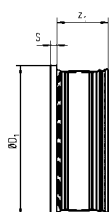
DN/ID	150	200	250	300	400	500	600	800	1000
Ø di	169,8	227,3	284,9	342,4	455,8	569,7	683,7	912,7	1143,7
Ø di ₁	149,0	199,0	248,8	298,0	395,0	494,0	593,0	792,0	991,5
L	110	110	110	110	110	170	170	170	200



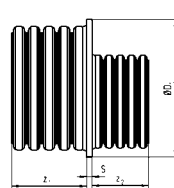
DN/ID	150	200	250	300	400	500	600	800	1000
Ø Di	169,8	227,3	284,9	342,4	455,8	569,7	683,7	912,7	1143,7
L	274	305	330	334	340	515	515	615	825



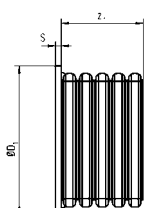
DN/ID	150	200	250	300	400	500	600	800	1000
Ø Di	169,8	227,3	284,9	342,4	455,8	569,7	683,7	912,7	1143,7
L	174	305	330	334	340	515	515	615	825



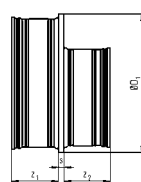
DN/ID	150	200	250	300	400	500	600	800	1000
Ø Di	185	270,0	329,0	386,0	502,0	617,7	733,0	966,3	1200,0
z ₁	137	152,5	165,0	167,0	170,0	257,5	257,5	307,5	412,5
S	10	10	20	20	20	20	20	20	20



DN/ID	200/150	250/200	300/250	400/300	500/400	600/500	800/600	1000/800
Ø D ₁	270	329,0	386,0	502,0	617,7	733,0	966,3	1200,0
z ₁	198,0	198,0	206,2	275,0	304,8	343,0	390,0	487,6
z ₂	144,3	192,5	198,0	206,2	275,0	304,8	348,0	390,0
S	10	10	20	20	20	20	20	20



DN/ID	150	200	250	300	400	500	600	800	1000
Ø D ₁	185	270,0	329,0	386,0	502,0	617,7	733,0	966,3	1200,0
z ₁	144,3	192,5	198,0	206,2	275,0	304,8	348,0	390,0	487,6
S	10	10	20	20	20	20	20	20	20



DN/ID	200/150	250/200	300/250	400/300	500/400	600/500	800/600	1000/800
Ø D ₁	270	329,0	386,0	502,0	617,7	733,0	966,3	1200,0
z ₁	137	165,0	167,0	170,0	257,5	257,5	307,5	412,5
z ₂	152,5	152,5	165,0	167,0	170,0	257,5	257,5	307,5
S	S	10	10	20	20	20	20	20



DROSSBACH GIGAPIPE Systems

Easy and simple jointing!

Application:

GIGAPIPE sewage and rainwater pipes are used as underground gravity lines, as well as for other non-pressure purposes that are of similar design while not exceeding: pH-value 2 (acidic) to pH-value 12 (alkaline), with a continuous operating temperature of maximum 35° Centigrade.

General installation rules and standards:

DIN EN 1610 (10/97):	Installation and examination of sewer pipes and channels (earlier DIN 4033)
ATV - worksheet A 139 (10/88):	Guideline for production of drainage lines and channels
DIN in 1986/1 to part 4:	Drainage systems for buildings and plots
ZTV A-StB 97 (1997):	Additional technical contract conditions and guidelines for excavations in areas with traffic
DIN 4124 (08/1981):	Excavations and slopes, trench widths and shuttering requirements



GIGAPIPE pipes installation:

Jointing of GIGAPIPE pipes is very easy and simple. GIGAPIPE pipes have an integrated in-line belling on one side, and a flat end on the other side. Pipes are jointed by simple inserting (no need for welding). There have been developed special tools, designed for easy and timesaving assembling.



1 Apply lubricant to the inside of the belling.



2 Insert the flat end of the pipe into the belling.



3 Put the second part of the tool between the ribs on the other pipe. Place the tool so that the first notch enters the stud.



4 Move the levers forwards and backwards.



5 Pipes are jointed when inserted pipe enters to the end of the belling.

DROSSBACH GIGAPIPE Systems

Bedding layers for perfect pipe support!

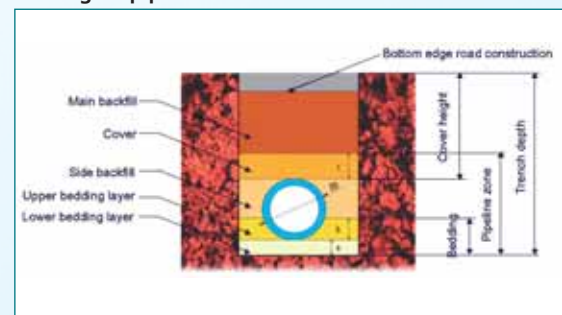
Together with the lower bedding layer [a] the upper bedding layer [b] forms the pipe support, which requires careful implementation and compacting in accordance with the load calculations. The thickness [b] of the upper bedding results in the bedding or support angle. This term is still widespread and characterises in an easily conceivable manner the bearing capacity of the bedding. For GIGAPIPE-PP, the following table shows the relation between the easily measurable thickness [b] of the upper bedding and the bedding angle. The main compression directly above the pipe should be placed at first with a minimum coverage "c" of 20 - 30 cm above the pipe end. The sewage pipe system GIGAPIPE-PP must be secured sideways at a high level in front of the compression.

Upper bedding layer „b" in mm for GIGAPIPE-PP

Nominal width in (mm)		Bedding angle [°]		
		90°	120°	180°
ID	OD	$K_{90} = 0,15$	$K_{90} = 0,25$	$K_{90} = 0,50$
150	169	25	42	85
200	225	34	56	113
250	282	42	71	141
300	339	51	85	170
400	452	68	113	226
500	565	85	141	283
600	678	102	170	339
800	906	136	227	453
1000	1134	170	284	567

K = the quotient from bedding layer and OD of the pipe

Making of pipe trenches under DIN EN 1610

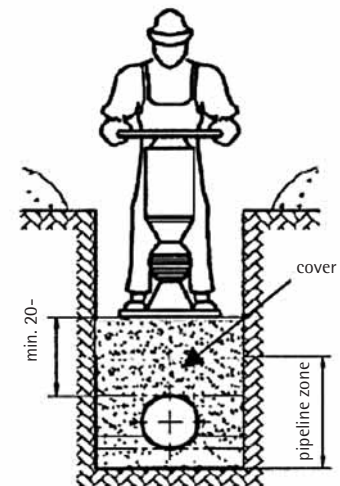


Our sample static calculation is based on the following initial values:

- ▶ Load: SLW 60 with asphalt or concrete road, no additional surface loads
- ▶ Solid ground: G3 / 97%
- ▶ Pipe bedding (pipeline zone): G2 / 95 %
- ▶ Cover (main backfill): G3 / 92 %
- ▶ Single trenches, slope angle 90° or dam yield
- ▶ No groundwater

Cover condition A1:

Trench backfill compacted in layers against the undisturbed soil without proof of the degree of compacting; applies to beam planking (Berlin-type sheeting) or insulating yield.



Bedding condition B1:

Bedding compacted in layers against the undisturbed soil or compacted in layers against the dam yield without proof of the degree of compacting; applies to beam planking (Berlin-type sheeting). Foundation like solid soil. Not to be placed on concrete! (This applies in principle to all flexible pipes, i.e. all plastic pipes)





Due to the broad experience in long-term tight corrugated pipe systems, high-quality plastic pipe manufacturing facilities as well as lasting pipe business services, DROSSBACH and its partners offers customer-orientated solutions. Furthermore close contacts to long-term partners verify DROSSBACH's high reputation world-wide.

DROSSBACH technology is used all over the world in different applications like sewage, storm water, drainage and cable protection. The combination of continuous improvements, innovative thinking and synergies of win-win partnerships is playing an important role in order to get a leading position in the corrugated pipe business.

 Made
in
Germany



Pars Ethylene Kish Co. is one of the major manufacturers of Polyethylene Pipes in Iran and the MIDDLE EAST, cooperating in the majority of the national projects.

Pars Ethylene Kish designs and manufactures one of the MIDDLE EAST'S largest and most diverse lines of polyethylene piping systems—pipe, valves, fittings, auxiliary components and tools—all engineered from the ground up to handle the full range of today's municipal, industrial, commercial and residential applications.

GERMAN 
Technology



Pars Ethylene Kish Co.

Tehran Head Office

No.18 , Mina blv, Africa St., Tehran/IRAN
Tel.: (+98 21) 88 20 20 60 (50 Line)
Fax: (+98 21) 88 20 20 81

Factory Address

Mola sadra st., Abooreyhan st
Eshtehard Industrial Town, TEHRAN/ IRAN

info@parsethylene-kish.com
www.parsethylene-kish.com

