



KG 2000 SN 10 Polypropylene

Waste water pipes

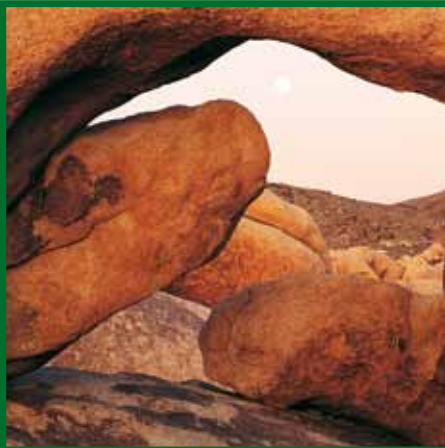
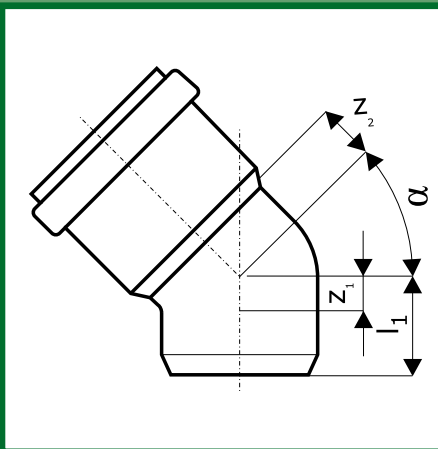
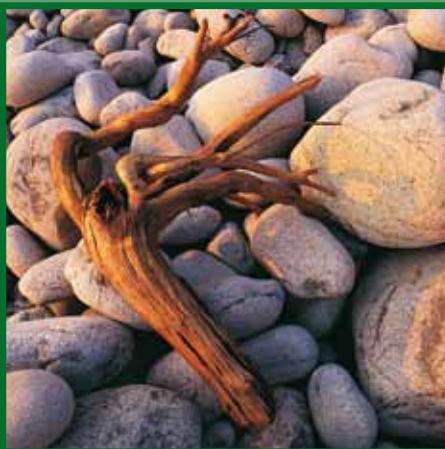


KG 2000 (PP) SN 10

NEW
DN 500

KG 2000 SN 10 Polypropylene

These days the world is future-oriented and facing modernization. Driven by the speed of today's world the modern man interferes more and more in the nature. As a consequence of our endeavour to pollute the environment as little as possible, the modern KG 2000 SN 10 Polypropylene waste water system has been developed to meet highest demands.





Benefits and
Advantages
of the System

Material Properties

MATERIAL

Polypropylene (PP), mineral-reinforced

PIPE CONSTRUCTION

Massive wall pipe system
with homogenous wall construction.

CONNECTION

Push-fit connection with a patented factory-inlaid gasket.

SEAL

Gaskets according to DIN EN 681.

COLOUR

Spring green RAL 6017.

QUALITY REQUIREMENTS

DIN EN 14758.

PRODUCTION

Plastics piping systems for non-pressure underground drainage and sewerage – Polypropylene with mineral modifiers (PP-MD).

The general requirements for components used in discharge pipes, drains and sewers for gravity systems according to DIN EN 476 as well as the general quality requirements of DIN 8078 are the basis for the production of the pipes and fittings.

AREA OF APPLICATION

Underground sewers and waste water pipes. The pipes are resistant to normal waste water (pH2 – pH 12) - see chapter Chemical resistance page 124ff.

- **MODERN HIGHLY-DEVELOPED PIPE WITH MASSIVE WALL TECHNOLOGY**
- **EXTENSIVE FULL RANGE DN 110 – 500**
- **STABILITY UNDER EXTREME CONDITIONS**
- **IMPROVED PATENTED GASKET**
- **HIGH IMPACT RESISTANCE**
- **HIGH ABRASION RESISTANCE**
- **SMOOTH INSIDE SURFACE**
- **EASY-TO-INSTALL**
- **LONG LASTING**
- **SLW 60 FROM 0.8 M**
- **RING STIFFNESS SN 10**
- **WITH NBR GASKETS USE AS GREASE PIPE WITH TRACE HEATING**
- **WITH NBR GASKETS SUITABLE FOR DRAINING PETROL STATION WASTE WATER**

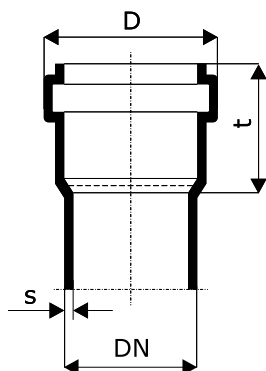


KG 2000 SN 10 Polypropylene

Waste water pipes for highest demands

Description

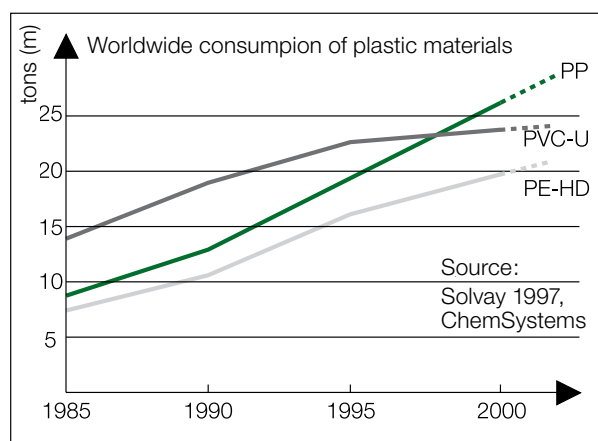
Polypropylene waste water pipes and fittings resistant to hot water and light effects, produced in accordance with DIN EN 14758-1.



DN(OD)	s [mm]	D [mm]	t [mm]
110	3,4	128,4	72
125	3,9	146,0	80
160	4,9	186,6	95
200	6,2	236,0	123
250	7,7	287,2	133
315	9,7	358,8	155
400	12,3	455,0	180
500	15,3	565,0	205

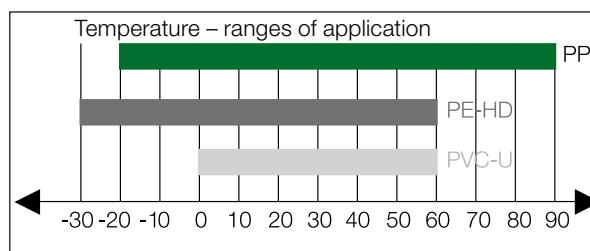
PP – The material of the future

Polypropylene (PP), polypropylene is a thermoplastic material belonging to the group of polyolefin's. These plastics have already been used with great success in pipe production for several decades. Polypropylene is also used in the automobile industry and in fuel stations since it meets high safety requirements. Guaranteed safety from a hygienic point of view, resistance to corrosion, good processing properties and several additional factors ensure a wide range of applications.

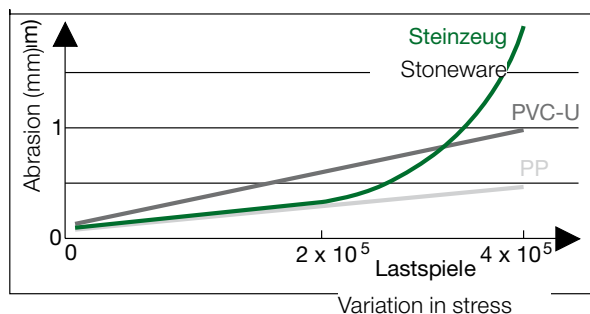


PP - PROPERTIES

With respect to DIN EN 476, polypropylene has excellent thermal properties. It can also be used under extreme conditions.



- High chemical resistance pH2 – pH 12 (acid/alkaline)
– resistant to bioorganic sulphuric acid corrosion
» see chapter Chemical resistance page 124ff
- High abrasion resistance of PP – long lasting and safe in operation



- Excellent impact resistance and extremely tough
– does not tend to crack or spread cracks
– robust under mechanical stress (e. g. high-pressure flushing)



- Smooth inside surface
 - optimal hydraulics
 - no incrustation
 - deposits do not get caught
 - self-cleaning, requires less maintenance

PP - Properties

An important requirement in private and public waste water systems is a long lasting water-tight pipe connection against leakage of waste water and ground water. The new innovative and patented gasket is a result of a long development. The decisive improvements are achieved by the special design.

The new sealing system

- 1 Tensioning lip
- 2 Retaining lip
- 3 Wiping lip
- 4 Sealing lip



The function of each gasket element

1 Tensioning lip

The tensioning lip prevents dirt build-up between the pipe wall and the gasket.

2 Retaining lip

The retaining lip causes the tensioning lip to be pressed against the foremost edge of the gasket groove. This stops the gasket ring from being pressed out or rolling.

3 Wiping lip

The wiping lip serves to keep back any dirt on the pipe.

4 Sealing lip

The sealing lip assures a tight long-term pipe connection.

Leakage test according to DIN EN 1610 with air and water from 0.05 bar to 0.5 bar and vacuum. (System test 3.0 bar MPA Darmstadt).



Insertion forces

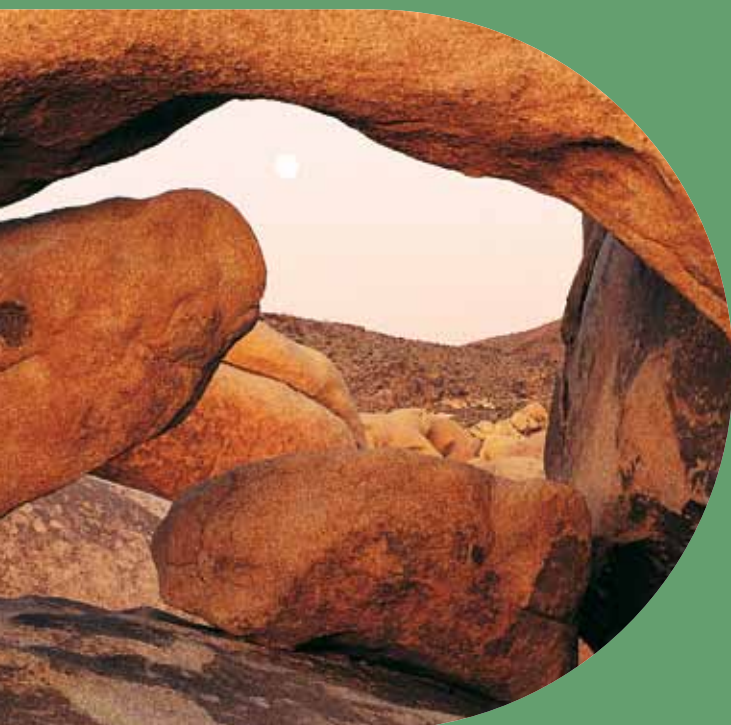
The insertion forces are considerably reduced by the special gasket design. This makes installation far easier compared to the usual sewer pipe systems.

Ecological value to the environment

- material Polypropylene PP
- ground water neutral
- durable leak-proof pipe connection

Polypropylene, an environmentally-friendly material due to the method of production, recyclability and the resistance to aggressive media. The new KG 2000 SN 10 sealing system provides enhanced protection against infiltration and exfiltration of waste water into the ground water.

Polypropylene – ecologically valuable, the material of the future.



Product Range
KG 2000 SN 10
Polypropylene

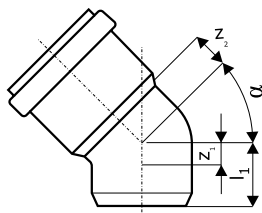
KG 2000 – Pipe SN 10

KG2000EM – Single socket pipe (push-fit)

No.	DN	L [mm]	Unit
770320	110	500	1/80
770340	110	1000	1/80
770360	110	2000	1/80
770380	110	5000	1/80
770420	125	500	1/60
770440	125	1000	1/54
770460	125	2000	1/54
770480	125	5000	1/54
770520	160	500	1/35
770540	160	1000	1/35
770560	160	2000	1/35
770580	160	5000	1/35
770620	200	500	1/20
770640	200	1000	1/25
770660	200	2000	1/25
770680	200	5000	1/25
770740	250	1000	1/16
770770	250	3000	1/16
770790	250	6000	1/16
770840	315	1000	1/9
770870	315	3000	1/9
770890	315	6000	1/9
770940	400	1000	1/4
770970	400	3000	1/4
770990	400	6000	1/4
771040	500	1000	1/4
771070	500	3000	1/4
771090	500	6000	1/4



KG 2000 – Fitting SN 10



KG2000B – Bend 15°

No.	DN	α	z_1	z_2	l_1	Unit
771300	110	15°	9	16	87	4/260
771400	125	15°	10	19	93	4/160
771500	160	15°	24	19	120	4/84
771600	200	15°	15	31	158	1/40
771700	250	15°	23	44	163	1/24
771800	315	15°	28	56	188	1/12
771900	400	15°	29	67	220	1/6
771100	500	15°	67	183	263	1/2

KG2000B – Bend 30°

No.	DN	α	z_1	z_2	l_1	Unit
771310	110	30°	17	23	95	4/240
771410	125	30°	19	27,5	102	4/160
771510	160	30°	24	34	125	4/84
771610	200	30°	29	46	162	1/40
771110	500	30°	101	217	297	1/2

KG2000B – Bend 45°

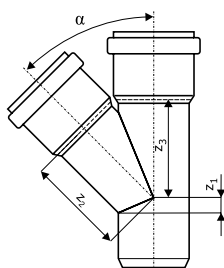
No.	DN	α	z_1	z_2	l_1	Unit
771320	110	45°	26	29	94	4/200
771420	125	45°	29	36	112	4/144
771520	160	45°	37	45	144	4/60
771620	200	45°	46	57	189	1/38
771720	250	45°	59	77	199	1/20
771820	315	45°	73	98	233	1/10
771920	400	45°	92	120	283	1/5
771120	500	45°	138	254	334	1/2

KG2000B – Bend 67°

No.	DN	α	z_1	z_2	l_1	Unit
771330	110	67°	41	47	119	4/180
771430	125	67°	44	54	127	4/120
771530	160	67°	56	69	161	2/60

KG2000B – Bend 87°

No.	DN	α	z_1	z_2	l_1	Unit
771350	110	87°	59	65	137	4/160
771450	125	87°	66	72	145	4/108
771550	160	87°	84	91	180	2/60

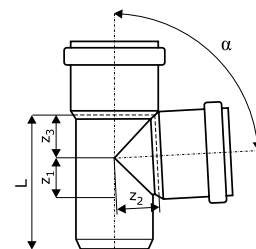


KG2000EA – Branch 45°

No.	DN	α	z_1	z_2	z_3	L [mm]	Unit
772330	110/110	45°	26	134	134	228	4/96
772340	125/110	45°	81	91	91	240	2/76
772440	125/125	45°	29	152	152	255	2/64
772350	160/110	45°	2	168	162	250	2/46
772450	160/125	45°	10	179	175	260	2/40
772550	160/160	45°	37	195	195	320	2/28
772560	200/160	45°	19	221	218	-	1/20
772660	200/200	45°	46	244	244	-	1/15
772760	250/160	45°	57	258	311	-	1/10
772770	250/250	45°	57	311	311	-	1/8
772850	315/160	45°	40	301	250	-	1/7
772860	315/200	45°	72	325	393	-	1/5
772880	315/315	45°	72	393	393	-	1/4
772940	400/160	45°	82	394	526	-	1/3
772960	400/200	45°	55	417	555	-	1/2
772990	400/400	45°	78	683	683	-	1/1
771130	500/160	45°	-	-	-	820	1/2

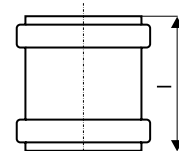
KG2000EA – Branch 87°

No.	DN	α	z_1	z_2	z_3	L [mm]	Unit
774330	110/110	87°	59	64	64	197	4/120
774350	160/110	87°	15	141	140	227	2/46
774550	160/160	87°	81	91	91	279	2/32



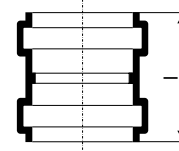
KG2000U – Coupler

No.	DN	I [mm]	Unit
778300	110	136	4/280
778400	125	151,4	4/200
778500	160	185	4/96
778600	200	239	1/54
778700	250	275	1/30
778800	315	299	1/12
778900	400	345	1/8
771160	500	394	1/4



KG2000MM – Double socket

No.	DN	I [mm]	Unit
777300	110	136	4/280
777400	125	151,4	4/200
777500	160	185	4/96
777600	200	239	1/54
777700	250	275	1/30
777800	315	299	1/12
777900	400	345	1/8
771170	500	407	1/4



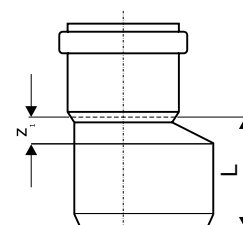
KG2000M – Plug

No.	DN	I [mm]	Unit
777320	110	55	4/780
777420	125	55	4/580
777520	160	70	4/260
777620	200	85	2/160
777720	250	88	1/100
777820	315	98	1/50
777920	400	116	1/32
771180	500	149	1/12



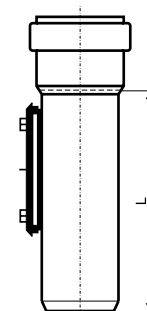
KG2000R – Reducer – eccentric

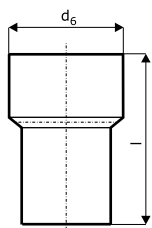
No.	DN	z_1	L [mm]	Unit
775340	125/110	16	99	4/240
775350	160/110	34	135	4/192
775450	160/125	28	129	4/104
775560	200/160	32	175	2/60
775670	250/200	49	181	1/40
775780	315/250	63	215	1/25
775880	400/315	91	271	1/10
771190	500/400	116	312	1/4



KG2000RE – Inspection pipe

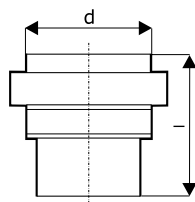
No.	DN	L [mm]	Unit
778310	110	308	2/80
778410	125	313	2/70
778510	160	380	1/40
778610	200	410	1/20





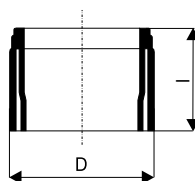
KG2000UG – Connection piece to cast-iron pipe

No.	DN	d ₆	I [mm]	Unit
778320	110	124	133	4/420
778420	125	151	151	1/360
778520	160	176	165	1/210



KG2000US – Connection piece to stoneware pipe – spigot end

No.	DN	d [mm]	I [mm]	Unit
777380	110	138	168	4/288
777480	125	163	172	1/180
777580	160	194	226	4/96



KG2000USM – Connection piece to stoneware pipe - socket

No.	DN	D [mm]	I [mm]	Unit
777390	110	132	90	4/380
777490	125	160	92	1/320
777590	160	187	97	4/168

KG 2000 – Accessories

KG2000 – Lip seal



No.	DN	Unit
880400	110	20
880410	125	18
880420	160	21
880430	200	10
880440	250	-
880450	315	-
880460	400	-
880470	500	-

KG2000 – NBR gasket (oil resistant)



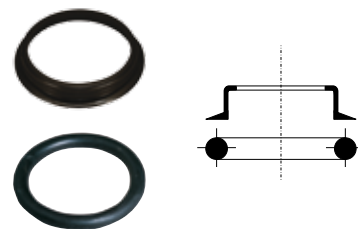
No.	DN	Unit
880500	110	20
880510	125	27
880520	160	10
880530	200	10
880540	250	-
880550	315	-
880560	400	-
880570	500	-

**NEW!** KG2000 – GA-Gasket

No.	DN	Unit
881025	110	16

KG 2000 – Accessories**KG2000 – GA-Set gasket**

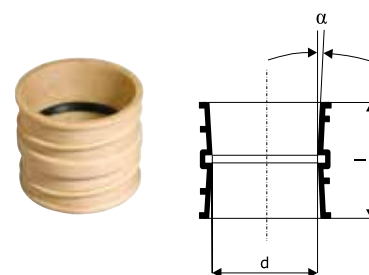
No.	DN	Unit
881030	125	10
881040	160	15

**KG2000 – Profile gasket for KGUS**

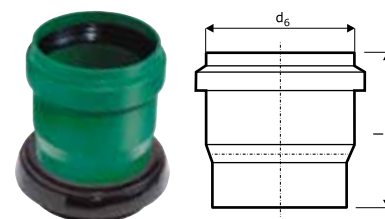
No.	DN	Unit
881100	110	144
881110	125	90
881120	160	50

**KGf PU – Chamber lining**

No.	DN	α	d [mm]	l [mm]	Unit
820900	110	3°	110,4	110	1/325
821900	125	3°	125,4	110	1/270
822900	160	3°	160,5	110	1/180
823900	200	3°	200,6	110	1/114
820910	110	3°	110,4	240	1/168
821910	125	3°	125,4	240	1/135
822910	160	3°	160,5	240	1/84
823910	200	3°	200,6	240	1/45
824910	250	3°	250,8	240	1/33
825910	315	3°	316,0	240	1/18
826910	400	3°	401,2	240	1/15
827910	500	3°	501,5	240	1/12

**KG2000BA – Connection to concrete pipe**

No.	DN	l [mm]	Unit
877570	150	165	1/90
877670	200	197	1/40

**KG2000 – Lubricant**

No.	ml	Unit
881800	150	50/1750
881810	250	50/1500
881820	500	24/720
881830	1000	12/360





Installation Instructions

1. SCOPE

The following instructions apply for utilization and installation of KG2000 SN 10 pipes and fittings made of polypropylene (PP), colour spring green RAL 6017, which serve as non-pressure underground pipes for the drainage of waste water according to DIN 1986-3.

For the production of waste water piping systems, the recommendations under DIN 1986-1, DIN 1986-4 and DIN EN 1610 apply.

2. AREA OF APPLICATION

KG 2000 SN 10 polypropylene waste water pipes and fittings are suitable for the use as underground pipes, sewer connections and sewer pipes for the drainage of waste water in accordance with DIN 1986-3. In special cases the chemical resistance can be seen in the DIN 8078 supplementary sheet no. 1.

KG 2000 SN 10 pipes and fittings can be used as:

- a) Ground pipes
- b) Connection sewers

as well as in heavy duty areas (SLW 60) with a minimum covering of 0.8m, with a maximum covering of 6 m and in ground water regions.

3. TRANSPORTING AND STORING KG 2000 SN 10 PIPES AND FITTINGS

The pipes and fittings are to be protected against damage. The pipes should be supported over their entire length during transport in order to avoid sagging. Impact stress – especially under freezing temperatures – must be avoided.

Pipes and fittings may be stored outdoors. The following measures must be observed on storing pipes:

- a) Pipes must be stored in such a manner that perfect support is ensured and no deformations can occur.
- b) The pipe layers can be stored both with and without wood in between them.
- c) On storing, the pipe sockets should be horizontally and vertically unhampered.
- d) A stacking height of 2 meters should not be exceeded.

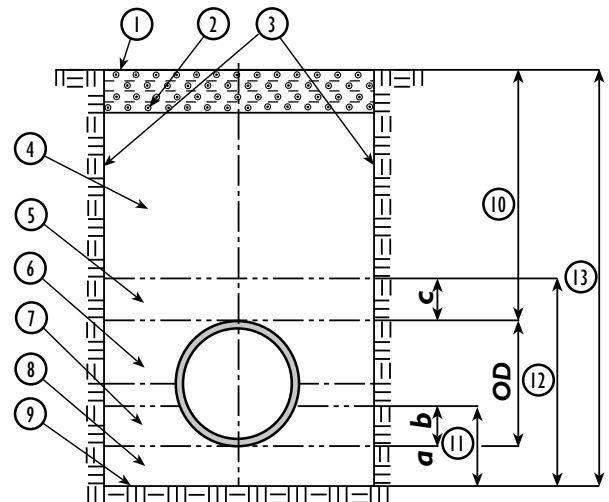
Rubber sealing elements, if not protected, should not be stored outside for long periods.

4. SUPPORT AND EMBEDDING

Pipes can be laid in consistent, relatively loose, fine-grained soil if a support along the entire length is possible. At the sockets, hollows are to be made in the lower embedding area so that the connection can be properly carried out. The hollows may not be larger than necessary in order to carry out proper connections.

Should the soil in question not be suitable as a support, the ditch bed must be dug deeper and a support made. The thickness of the lower embedding layer may not exceed the following:

- a) 100 mm in the case of normal soil
- b) 150 mm in the case of stones or compact soil



- | | |
|--|--|
| 1 Surface | 10 Cover height |
| 2 Lower edge of the road or rail structure, if present | 11 Thickness of embedding |
| 3 Ditch walls | 12 Thickness of the piping area |
| 4 Main filling (3.6) | 13 Ditch depth |
| 5 Cover (3.5) | a Thickness of the lower bedding layer |
| 6 Side filling (3.12) | b Thickness of the upper bedding layer |
| 7 Upper bedding layer | c Thickness of the cover |
| 8 Lower bedding layer | |
| 9 Ditch bed | |

The thickness of the upper embedding layer should be carried out in such a manner that structural analysis conditions are fulfilled and a support angle of 180° is achieved, i.e. generally 0.5 x DA. Should the bed of the ditch prove to not have sufficient supporting properties, special measures are required. Should, due to the construction, a concrete slab be necessary in the area on which the pipes rest, it is recommended that provision is made for an intermediate layer of suitable soil between the pipe and slab. This layer should be 150 mm under the pipe shaft and 100 mm under the connection.

Should, for structural reasons, additional steps for instalment be considered essential, a concrete slab above the covering area is recommended instead of a concrete jacket for load distribution purposes. Should a concrete jacket be planned, it is to be produced in such a manner that the entire structural load can be absorbed by the jacket.

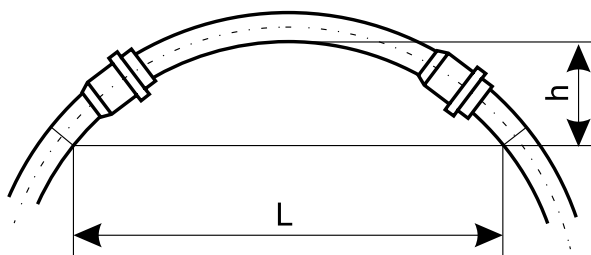
5. EMBEDDING IN CONCRETE

Polypropylene pipes and fittings may be directly embedded in concrete. However, the following instructions must be observed:

- Cover the socket gap with adhesive tape so that no concrete grout can seep in, which may then hinder the subsequent functioning of the push-fit socket.
- Protect the pipes against uplifting. The intervals between the mounting points must ensure that no excessive sagging can occur (formation of water traps).
- Thermal changes in length, both on installation and in subsequent operation, must be taken into consideration.

6. INSTALLATION PROCEDURE

Prior to installation, KG 2000 SN 10 pipes and fittings must be checked for any damage. Each pipe and fitting is to be levelled according to gradient and direction. A straight, continuous path in the stipulated gradient is to be observed. In special instances, the DN 110 to DIN 315 pipe routing can be installed as indicated in the following diagram. However, the data indicated in the following table may not be exceeded.



(Bending of pipes > DN 200 is practically impossible in view of their greater intrinsic rigidity)

Gauges h max. or bending radii in meters at a length L:

DN	h			
	110	125	160	200
8	0,24	0,21	0,17	0,13
12	0,54	0,48	0,38	0,30
16	0,97	0,85	0,67	0,53
R [m]	33	38	47	61

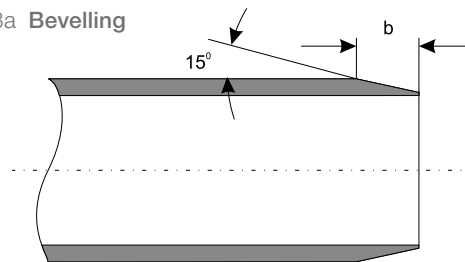
7. CUTTING TO LENGTH AND BEVELLING

If necessary, pipes may be cut to length with a suitable plastic cutter or fine-toothed saw. Cuts are to be made at right angles to the pipe axis. A guiding frame may be useful.

Fig. 3 Cutting to length with a frame



Fig. 3a Beveling



Fittings may not be shortened as otherwise their seal tightness property suffers.

DN	110	125	160	200	250	315
b mm ca.	6	6	7	9	9	12

The cutting edges must be trimmed. The pipe ends must be bevelled at an angle of approx. 15°, as in the illustration, using either a suitable tool for beveling or a coarse file.

8. SETTING UP THE CONNECTION AT PIPES AND FITTINGS

- Remove any dirt from the inserting end (spigot end) and sockets and, if necessary, from the sealing element.
- Check the position of the sealing elements and make sure they are in perfect condition.
- Coat the beveling of the inserting end evenly with a lubricant. Do not use any oil or grease!
- Push the inserting end into the socket until it resists and make a marking on the edge of the socket with a pencil or a felt-tip pen. Finally the pipe end must be pulled approx. 3 mm per metre of installed total length. It must, however, be pulled out at least 10 mm. The installation of couplers and double sockets is carried out in the same manner.

9. CONNECTION TO CONSTRUCTIONS

Connections to constructions (chambers etc.) are to be carried out with joints using chamber inner linings (KGF). Sealing between the chamber inner lining and the sewer pipe is carried out by means of the rubber sealing ring.

10. FILLING AND SEALING

Either earth at the location or material delivered can be used as material for the piping area as long as neither the pipe material nor the ground water are affected. A suitable bedding material is layered, grainy loose soil with a maximum granule size of <22 mm or alternately crushed construction materials with a maximum granule size of 11 mm. Hydraulically combined construction materials such as stabilised soil, light concrete, lean-mixed concrete, non-reinforced concrete are suitable.

During the procedure of filling and sealing in the region of pipes up to 30 cm above the pipe shaft, particular care must be taken that

- Pipes are not brought out of alignment or position. Sand cones or other accessories may be of assistance.
- By means of layering suitable soil and intensive compressing up to and above the recommended height, it is ensured that no hollows form under the pipes and the supporting angle stipulated in the structural analysis is achieved.

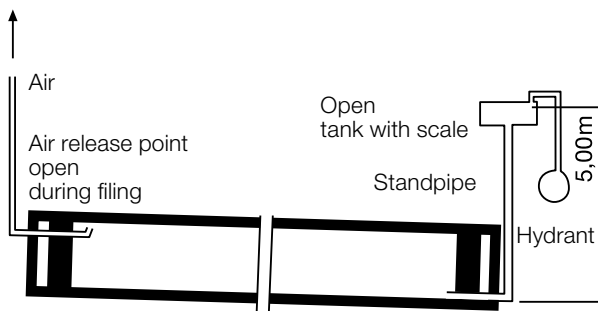
Compression and the material fed in contribute directly to stability. Each layer is to be compressed either manually or with the help of light machines. Finally the remaining main filling is to be carried out in accordance with planning and instructions, in order to avoid surface subsidence.

11. WATERTIGHT TEST

Checking to see that piping, shafts and inspection openings are watertight is either to be carried out with air (procedure "L") or with water (procedure "W"). In the case of procedure "L" the number of corrective measures and repeated checks in the case of failure is unlimited. In the case of a single or repeated failure to pass the test with air, moving on to testing with water is permissible. The result of the test with water is then decisive.

TESTING WITH WATER

All openings of the section of piping to be checked as well as branches and junctions are to be closed in a watertight manner and secured against pressure and being pressed out. It is recommended – particularly in the region of the property – that the large number of fittings be anchored by means of driving in posts or by means of anchoring them with appropriate locking clamps so that any changes in position are avoided. In straight pipelines, too, pipes and inspection stoppers are to be supported accordingly against horizontal pressure. The piping, should it not have been covered, is to be secured against changes in position. The piping is to be filled with water in such a manner that it is free of air. Therefore it makes sense to fill the pipes slowly from the lowest point so that the air present in the pipes can escape from the sufficiently-large air release points at the highest point of the piping.



Sufficient time (one hour) is to be provided between filling and checking the piping in order to allow any air flowing into the pipes on filling and remaining there to gradually escape. The test pressure is to be taken at the lowest point in the part to be checked. Non-pressure pipes are to be checked with 0.5 bar excess pressure. The test pressure, which must have been achieved prior to testing, has to be maintained for 30 minutes in accordance with DIN EN 1610. If necessary, the quantity of water required is to be constantly filled and gauged.

The test requirements have been fulfilled when the volume of water added in 30 minutes is not more than 0.15 l/m² for pipes.

Please note: m² describes the moistened inner surface.

TESTING WITH AIR

General: The alternative air pressure test, due to its many advantages over the water pressure test, is the more popular procedure.

Testing with air (testing procedure "L"): Recommendations for testing time for piping (without shafts and inspection openings) can be seen on the following table, taking into consideration the respective pipe diameters.

The procedure should be stipulated by the client. For reasons of safety, careful handling and testing are emphasised. Attention must be paid to tight fittings of the shutoff elements!

Test procedure	P ₀ *) (mbar)	Δp (kPa)	DN 110	DN 125	DN 150
LC	300 (5)	50 (30)	3	3	3
Kp-value			0,06	0,06	0,06

Test procedure	P ₀ *) (mbar)	Δp (kPa)	DN 200	DN 250	DN 315
LC	300 (5)	50 (30)	3	3,5	4
Kp-value			0,06	0,06	0,06

*) Pressure above atmospheric pressure