Omniplast Drain and Sewer Pipe Programme PVC-U
= System Bipeau SN 4 =
Omniplast Drain and Sewer Pipe Programme PVC-U

ALPHACAN
Omniplast

Trade name
Omniplast drain and sewer pipe
=System Bipeau SN 4=

Material
Unplasticized polyvinylchloride modified (PVC-U mod.), without plasticizers; suspension polymerizate of vinylchloride (S-PVC)

Quality requirements and technical delivery conditions
Certfication programme ZP 7.1.15 of DIN CERTCO, Berlin (Association for Quality Control)
Approval No. Z-42.1-101 of Deutsches Institut für Bautechnik, Berlin (DIBt);
DIN V 19534, part 1 and part 2 resp. DIN EN 1401-1; prEN 13476-1; DIN 16961 - part 1 and part 2;
E DIN 19566 - part 1 and part 2; E DIN 19568-100.

Chemical resistance
Supplement 1 to DIN 8061

Colour
Orange-brown according to RAL 8023

Marking
Omniplast drain and sewer pipes =System Bipeau SN 4= bear the following permanent markings:
- the quality mark „DIN plus" of DIN CERTCO
- the name "Omniplast"
- the term "Kanalrohr PVC-U = System Bipeau SN 4="
- the nominal diameter DN
- the outside diameter d_1 and the wallthickness s_1
- the approval number of DIBt; Z-41.1-101
- the date of manufacture - day, month, year
- the number of the extrusion line
- the term "Maße entsprechen DIN V 19534"

Fittings are furthermore marked with the degrees of the angles and/or the nominal diameter.

Ring seals bear the following permanent markings:
- the number of DIN standard 4060/ EN 681-1
- the approval number of DIBt
- the trade name of the manufacturer
- a reference to the year of manufacture
- the nominal size
- the number of the mould and the cavity

Nominal diameters (DN)

100	125	150	200
250	300	400	500

Outside diameters (OD)

110	125	160	200
250	315	400	500

Laying length (mm)

DN 100 - 200:	500	1000	2000	5000
DN 250 - 400:		1000	2000	5000

Nominal ring stiffness (SN)
SN 4: ≥ 4 kN / m^2

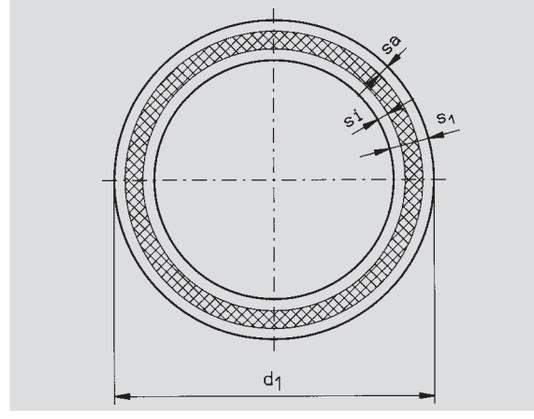
Jointing
Push-fit sockets

Sealing material
Pre-inserted lip ring seal, system BL

Test marks
Z-41.1-101 of DIBt

Quality mark
DIN plus of DIN CERTCO - Gesellschaft für Konfirmitätsbewertung, Berlin

Applications
house drainage
underfloor drain pipes
house connecting drain pipes
gravity sewer lines



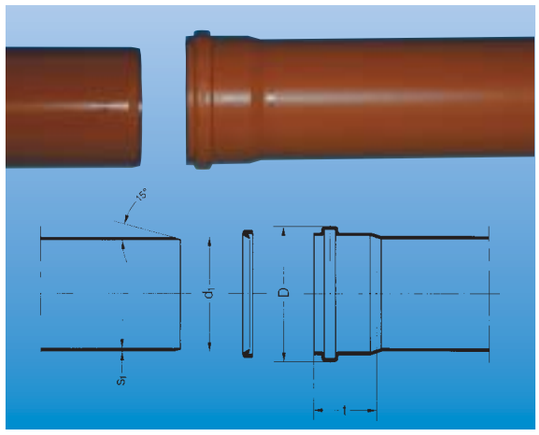
Measurement

DN	d_1	s_1	s_a	s_i
100	110	3,0	0,4	0,45
125	125	3,0	0,4	0,45
150	160	3,6	0,5	0,55
200	200	4,5	0,6	0,65
250	250	6,1	0,7	0,75
300	315	7,7	0,8	0,90
400	400	9,8	1,0	1,10
500	500	12,2	1,2	1,30

Delivery Programme

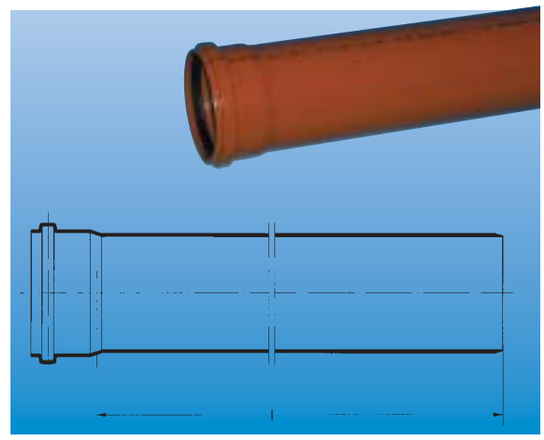
	laying length in mm				
DN	500	1000	2000	3000	5000
100	x	x	x	x	x
125	x	x	x	x	x
150	x	x	x	x	x
200	x	x	x	x	x
250	-	x	x		x
300	-	x	x		x
400	-	x	x		x
500	-	x	x		x

Omniplast Drain and Sewer Pipe Programme PVC-U
= System Bipeau SN 4 =



Socket and spigot end measurement

DN	d_1=OD	s_1	D	t
100	110	3,0	127	61
125	125	3,0	144	72
150	160	3,6	182	86
200	200	4,5	225	106
250	250	6,1	286	128
300	315	7,7	355	155
400	400	9,8	448	183
500	500	12,2	560	200



Pipes with push-fit socket KGEM

DN	l	kg
100	500	0,668
	1000	1,249
	2000	2,411
	3000	3,573
	5000	5,897
125	500	0,773
	1000	1,433
	2000	2,754
	3000	4,075
	5000	6,717
150	500	1,330
	1000	2,439
	2000	4,656
	3000	6,873
	5000	11,307
200	500	2,204
	1000	3,968
	2000	8,495
	3000	11,022
	5000	18,307
250	1000	6,571
	2000	12,236
	5000	29,231
300	1000	10,686
	2000	19,704
	5000	46,753
400	1000	17,805
	2000	37,250
	5000	76,665
500	1000	29,150
	2000	52,849
	5000	123,946

Omniplast Sewer Pipe Programme PVC-U = System Bipeau SN 4 = = A product of top quality and latest technological development =

ALPHACAN, a subsidiary of Atofina, which is the chemical line of business of TOTAL, took over in 1984 the PVC-U =Bipeau= sewer pipe which has been developed by Messrs. Sogecan in 1978/79 and introduced in 1982. Owing to its excellent properties, this pipe won a wide market in Europe and overseas.

Omniplast, a subsidiary of ALPHACAN, took over the patent in 1990 and started in the same year the production of the Omniplast sewer pipes =System Bipeau=, which are represented on the German market with great success.
Omniplast Sewer Pipes PVC-U = System Bipeau SN 4 = are co-extruded according to a patented procedure. This means that two extrusion lines and one special co-extrusion tool produce in one single operation a pipe with walls consisting of multiple layers. The special thing about is the closed-pored cellular core of which inside and outside are homogeneously combined with a solid layer. Modified unplasticized polyvinylchloride now well-established for more than 60 years is used as material.

They are approved by Deutsches Institut für Bautechnik, Berlin (DIBt) : Z-42.1-101.

Their high ring stiffness is confirmed by the report Nr. 24281/88 of SKZ, Würzburg.

They are supervised independently by Staatliche Materialprüfungsanstalt Darmstadt.

They fulfil the demands of DIN 19550 for underground sewer pipes and lines.

Their dimensions are in accordance with DIN V 19534, part 1 and are compatible with pipes and fittings of other materials.

They are produced and supervised in accordance with the certification programme ZP 7.1.15 of DIN CERTCO - Gesellschaft für Konfirmitätsbewertung, Berlin - documented by the „DIN plus" quality mark.

Their good deformation behaviour is approved by test report nr. K 89448.2 (sandpit test) issued by Staatliche Materialprüfungsanstalt Darmstadt.

They meet the requirements of the future European system-standards.

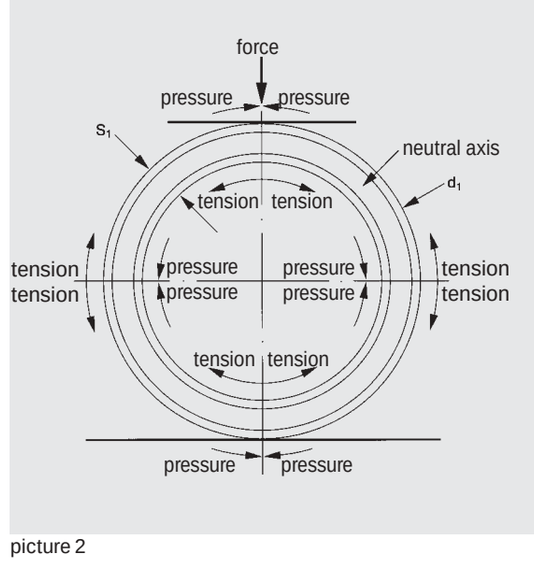
The system is root proof thanks to the lip ring seal acc. to DIN 4060. The lip ring seals are approved by Deutsches Institut für Bautechnik, Berlin (DIBt) and bear the „DIN plus" quality mark of DIN CERTCO - Gesellschaft für Konfirmitätsbewertung, Berlin.

High chemical resistance.
(Supplement 1 to DIN 8061)

Suitable for up-to-date sewerage cleaning methods approved by test report nr. 2029 dd. 27.07.1989 issued by the civil engineering office of the city Zurich.

Excellent abrasion resistance approved by the reports nr. 311/89 and 318/89 of Institute for Hydraulic Engineering at the technological university in Darmstadt.

The pipe wall structure of **Omniplast Sewer Pipes PVC-U = System Bipeau SN 4 =** considers in an optimum way the physical laws of mechanics. These loads reach a maximum at the top, at the bottom, and at the sides of the pipes (see picture 2).

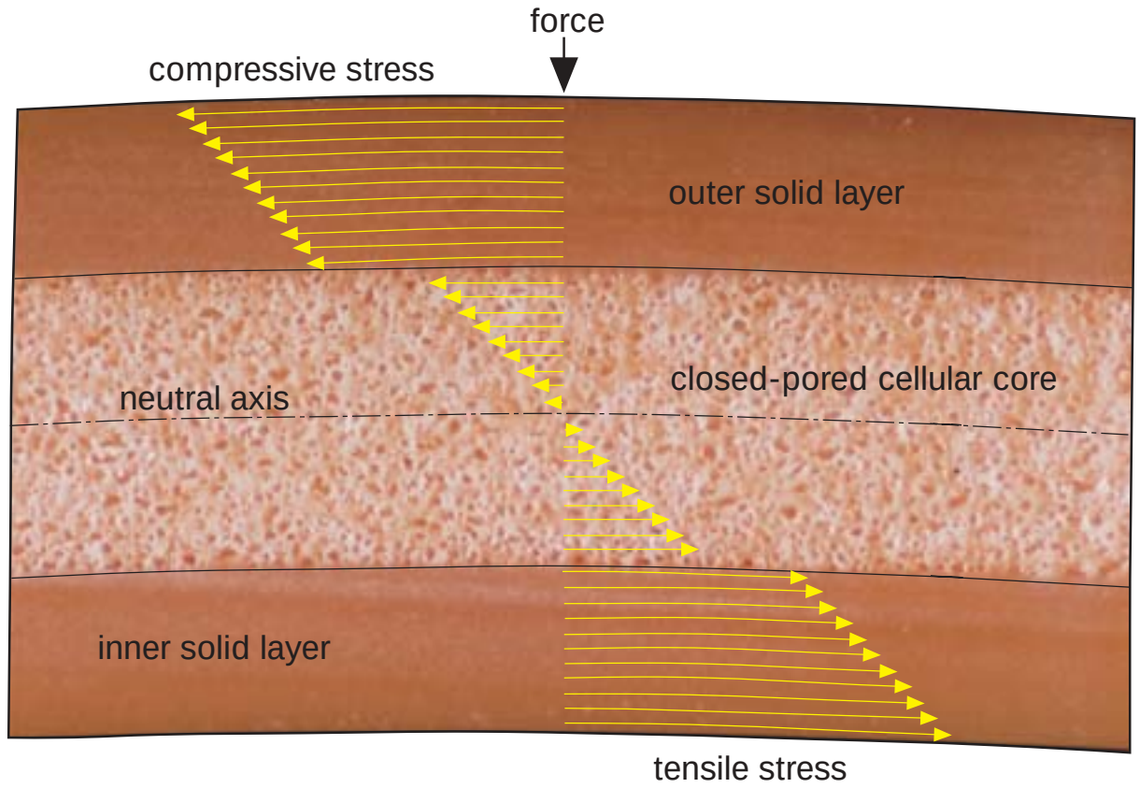


picture 2

Between outer and inner wall is a neutral axis which is not subject to traction nor to pressure, to say which is stressfree. The structure of the pipe walls of **Omniplast Sewer Pipes PVC-U = System Bipeau SN 4 =** take this fact into account: the solid inner and outer pipe zones are placed there where the maximum tensile stresses and compressive strains appear. The stressfree wall around the neutral axis consists of a foamed material of cellular structure and is located as a core between the solid pipe zones (see picture 3).

Its pipe wall structure taking into consideration the laws of strength of materials and circular ring statics, the **Omniplast Sewer Pipes PVC-U = System Bipeau SN 4 =** is excellently prepared for the actually prevailing forces.

For layings with extrem high demands on the loads we recommend our Omniplast Sewer Pipes = System Bipeau plus SN 8 =.
SN 8 is a systematical and continuous development with double ring stiffness.



picture 3

Trade name
Omniplast drain and sewer pipe

Material
Unplasticized polyvinylchloride (PVC-U), without plasticizers and fillers

Quality requirements
DIN 8061
Certification programme ZP 7.1.1/8 of DIN CERTCO, Berlin (Association for Quality Control)
DIN 19534-3
ÖNORM EN 1401-1
DIN EN 1401-1

Technical delivery conditions
DIN EN 1401-1
DIN 19534-3

Chemical resistance
Supplement 1 to DIN 8061

Colour
Orange-brown according to RAL 8023

Marking
Omniplast drain and sewer pipes bear the following permanent markings:
- the name "Omniplast"
- the term "Kanal" (on the socket)
- the quality mark „DIN plus" of DIN CERTCO
- the nominal size/OD
- the outside diameter d_1 and the wallthickness s_1
- the outside diameter/wallthickness relation SDR 41
- the nominal stiffness SN 4
- the number of DIN standard 19534-3
- the number of EN standard 1401-1
- the mark "UD" for the application inside and outside of buildings
- the mark ❄
- the material name "PVC-U"
- the date of manufacture
- the number of the extrusion line
- the test mark "ÖNORM EN 1401-1 geprüft" (ÖNORM EN 1401-1 approved)
- the test mark and the sign "KL N"
- fittings are furthermore marked with the degrees of the angles and/or the branches

Ring seals bear:
- the number of DIN standard 4060/ EN 681-1
- the trade name of the manufacturer
- a reference to the year of manufacture
- the nominal diameter
- the quality mark of DIN CERTCO
- the approval number of DIBt

Nominal diameters (DN)

100	125	150	200
250	300	400	500

Outside diameters (OD)

110	125	160	200
250	315	400	500

Laying length (mm)

DN 100 - 200:	500	1000	2000	5000
DN 250 - 400:		1000	2000	5000

Jointing
Push-fit sockets

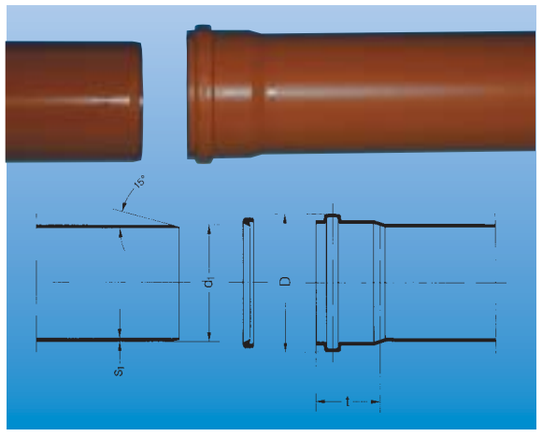
Sealing material
Pre-inserted lip ring seal, system BL

Test marks
"ÖNORM EN 1401-1 geprüft" (ÖNORM B 5184 approved)
VA 2.14/ DK 4701 for Denmark

Quality mark
DIN plus of DIN CERTCO - Gesellschaft für Konformitätsbewertung, Berlin

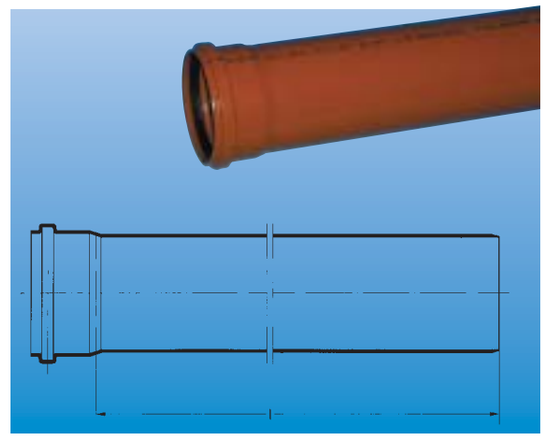
Applications
house drainage
underfloor drain pipes
house connecting drain pipes
gravity sewer lines

Omniplast Drain and Sewer Pipe Programme PVC-U



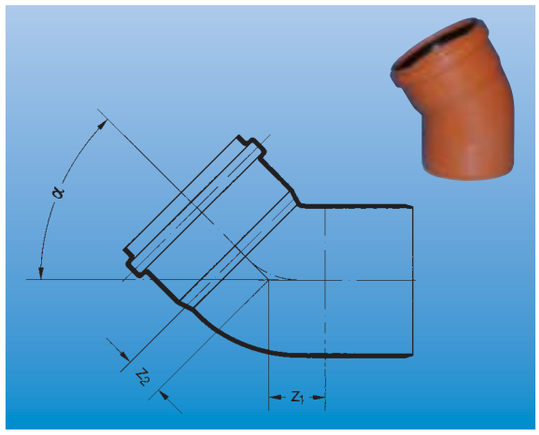
Socket and spigot end measurement

DN/OD	d_1	s_1	D	t
110	110	3,2	127	61
125	125	3,2	144	72
160	160	4,0	182	86
200	200	4,9	225	106
250	250	6,2	286	128
315	315	7,7	355	155
400	400	9,8	448	183
500	500	12,3	560	200



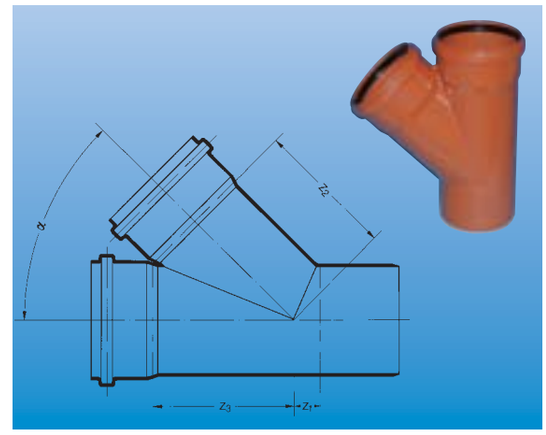
Pipes with push-fit socket KGEM

DN/OD	l	kg
110	500	0,914
	1000	1,709
	2000	3,299
	3000	4,890
	5000	8,070
125	500	1,064
	1000	1,973
	2000	3,791
	3000	5,609
	5000	9,246
160	500	1,762
	1000	3,230
	2000	6,167
	3000	9,154
	5000	14,968
200	500	2,790
	1000	5,022
	2000	9,526
	3000	13,950
	5000	22,974
250	1000	8,229
	2000	15,323
	5000	36,605
315	1000	13,342
	2000	24,601
	5000	58,378
400	1000	21,913
	2000	40,023
	5000	94,353
500	1000	35,146
	2000	61,906
	5000	145,188



Bends with push-fit socket KGB

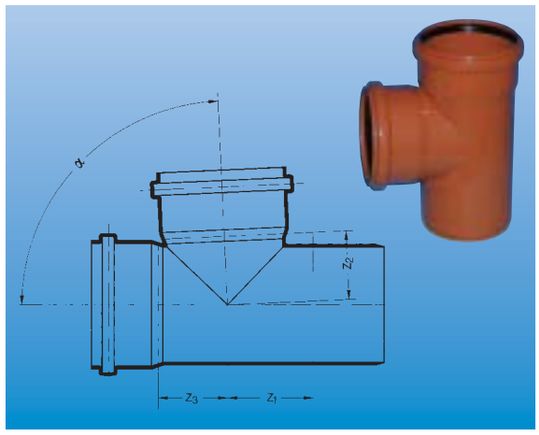
DN/OD	α	z_1	z_2	kg
110	15°	9	14	0,244
	30°	17	21	0,271
	45°	25	29	0,300
	67,5°	42	43	0,326
	87,5°	59	60	0,377
125	15°	10	14	0,323
	30°	20	25	0,357
	45°	30	33	0,356
	67,5°	45	49	0,436
	87,5°	67	68	0,496
160	15°	13	19	0,517
	30°	24	30	0,581
	45°	36	42	0,654
	67,5°	58	64	0,859
	87,5°	83	87	0,861
200	15°	15	23	1,041
	30°	38	46	1,069
	45°	46	54	1,239
	87,5°	105	113	1,748
250	15°	19	30	2,169
	30°	37	49	2,373
	45°	57	69	2,677
	87,5°	132	143	3,460
315	15°	73	85	3,760
	30°	130	146	4,180
	45°	72	86	4,779
	87,5°	462	470	6,050
400	15°	70	88	11,550
	30°	140	160	8,500
	45°	225	236	9,940
	87,5°	517	525	13,200
500	15°	96	112	14,900
	30°	178	184	16,900
	45°	268	276	36,500
	87,5°	598	625	51,500



Branches with push-fit socket 45° KGEA

DN/OD	α	z_1	z_2	z_3	kg
110/110	45°	25	134	134	0,619
125/110	45°	26	148	141	0,774
125/125	45°	39	152	152	0,823
160/110	45°	12	168	159	1,019
160/125	45°	24	177	172	1,318
160/160	45°	53	197	197	1,481
200/110	45°	57	204	246	1,715
200/125	45°	57	211	246	1,830
200/160	45°	57	229	246	2,061
200/200	45°	57	246	246	2,694
250/160	45°	9	261	244	3,575
250/200	45°	42	282	273	4,730
250/250	45°				
315/160	45°	- 33	354	304	5,540
315/200	45°	27	318	342	10,400
315/315	45°	72	378	802	11,073
400/160	45°	- 34	410	345	14,160
400/200	45°	- 4	435	380	16,750
500/160	45°	- 112	420	372	23,400
500/200	45°	- 85	441	399	24,300

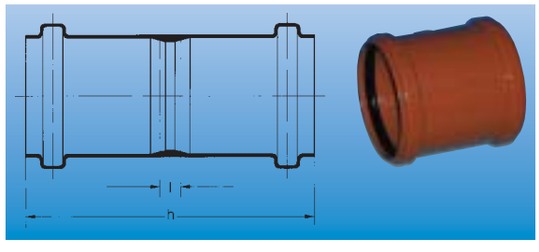
other dimensions upon request



Branches with push-fit socket 87,5°
KGEA

DN/OD	α	z_1	z_2	z_3	kg
100/110	87,5°	59	62	62	0,490
125/110	87,5°	59	70	63	0,599
125/125	87,5°	66	70	70	0,656
160/110	87,5°	60	87	65	0,924
160/125	87,5°	67	87	72	0,970
160/160	87,5°	84	89	89	1,248
200/110	87,5°	61	106	67	1,427
200/125	87,5°	71	108	77	1,488
200/160	87,5°	86	108	91	1,727
200/200	87,5°	105	111	111	2,084
250/160	87,5°	90	134	100	3,424
250/200	87,5°	132	136	143	4,150
250/250	87,5°	132	143	143	4,645
315/160	87,5°	93	164	104	6,600
315/200	87,5°	166	170	178	7,345
315/315	87,5°	166	178	178	8,450
400/160	87,5°				*
400/200	87,5°				*
500/160	87,5°				*
500/200	87,5°				*

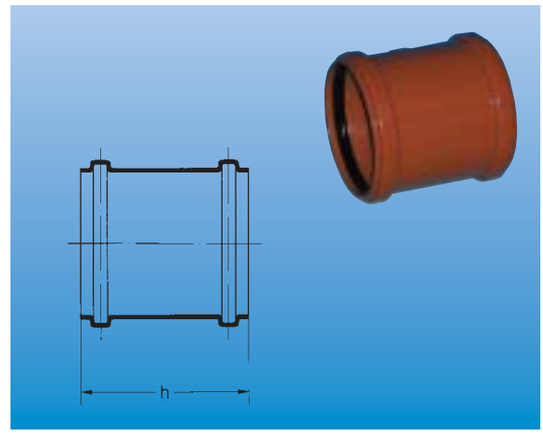
*measurements and weights upon request



Double socketed sleeves
KGMM

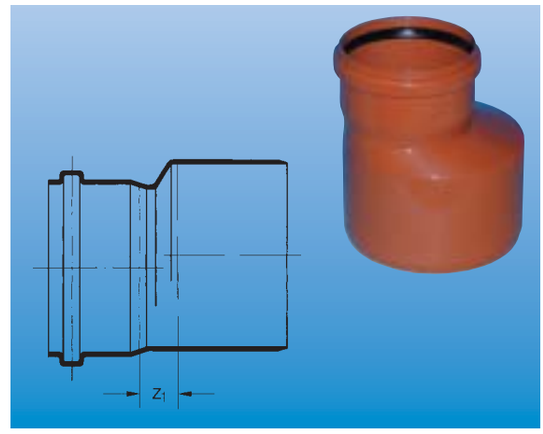
DN/OD	h	l	kg
110	106	3	0,190
125	156	3	0,275
160	173	3	0,510
200	226	3	1,030

other dimensions upon request



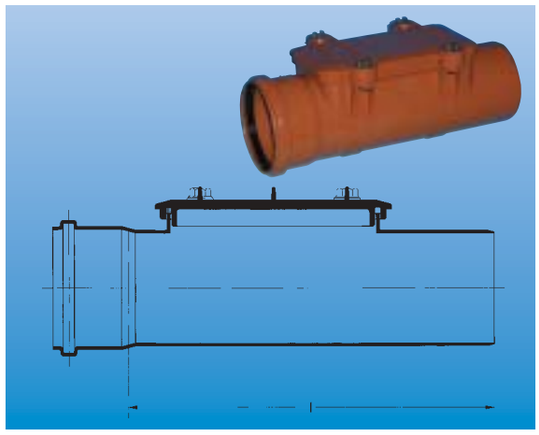
Double socketed sleeves
KGU

DN/OD	h	kg
110	106	0,187
125	156	0,271
160	183	0,502
200	226	0,995
250	263	1,982
315	330	3,601
400	390	6,337
500	426	11,280



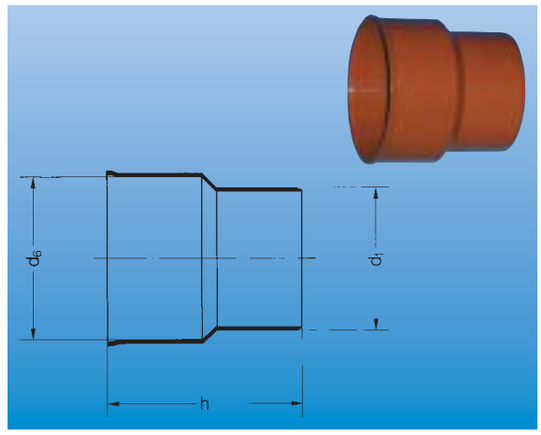
Reducers, eccentric
KGR

DN/OD	z_1	kg
125/110	25	0,284
160/110	33	0,477
160/125	27	0,452
200/160	31	0,793
250/200	38	1,686
315/250	16	3,380
400/315	18	6,240
500/400	22	12,000



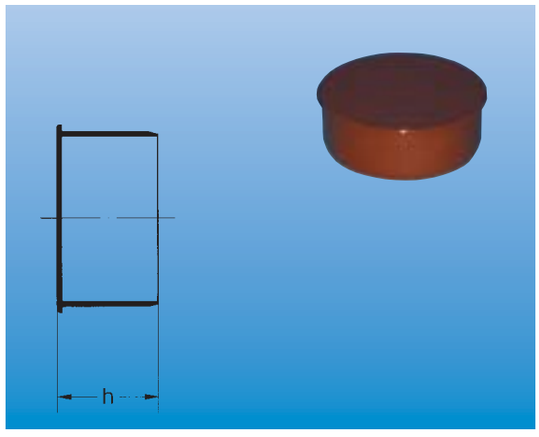
Inspection pipes in PVC-U KGRE

DN/OD	l	kg
110	288	0,625
125	296	0,739
160	313	1,125
200	410	4,106



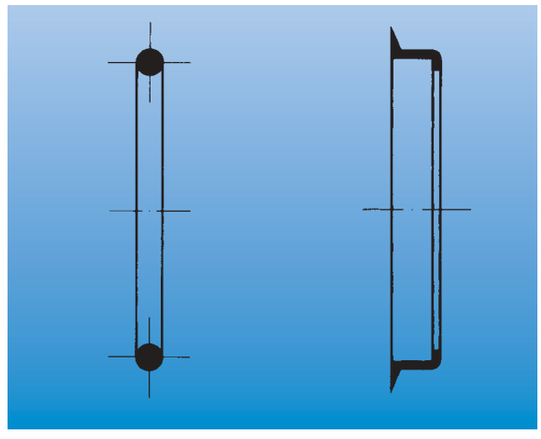
Adaptors for cast iron pipe spigot ends KGUG

DN/OD	d_1	d_6	h	kg
110	110	124	149	0,225
125	125	151	166	0,325
160	160	176	182	0,490
200	200	226	222	1,008



Pipe plugs in PVC-U KGM

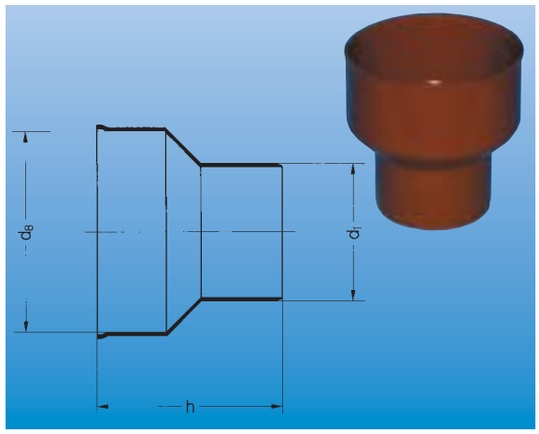
DN/OD	h	kg
110	47	0,106
125	50	0,136
160	58	0,256
200	76	0,465
250	98	1,077
315	103	1,963
400	105	6,000
500	115	15,600



Double seals for cast iron pipe adaptors (GA-set); test mark PA-I 2311

DN/OD	110	125	125	160	200
	A G	A G	AK GK	A G	A G

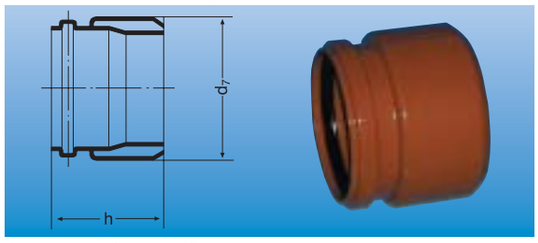
A = outer ring G = inner ring
AK/GK = reinforced, to be used only for transition fitting to cast iron pipe socket OD 125



Adaptors for vitrified clay pipe spigot ends*
KGUS

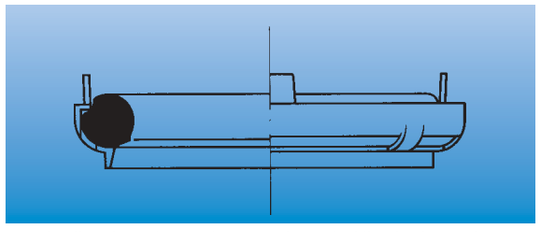
DN/OD	d_1	d_8	h	kg
110	110	159	165	0,310
125	125	191	185	0,400
160	160	220	200	0,672
200	200	278	225	1,185

* also available with integrated gasket



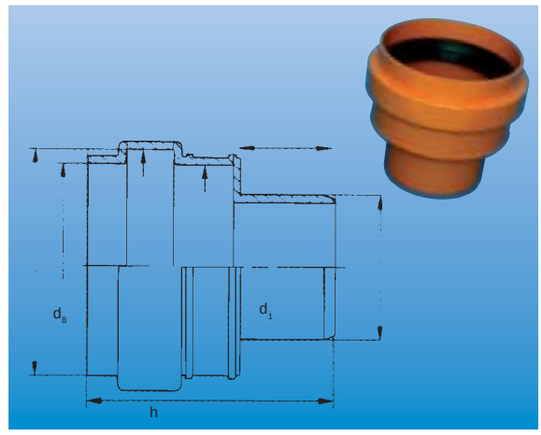
Adaptors for vitrified clay pipe sockets
KGUSM

DN/OD	d_7	h	kg
110	133	107	0,310
125	160	108	0,374
160	187	121	0,590
200	242	226	0,850



Push-fix ring for adaptor for vitrified clay pipe spigot ends;
testmark PA-I 3228

DN/OD	110	125	160	200



Adaptors for vitrified clay pipe spigot ends
Type J with profile ring
KGUS

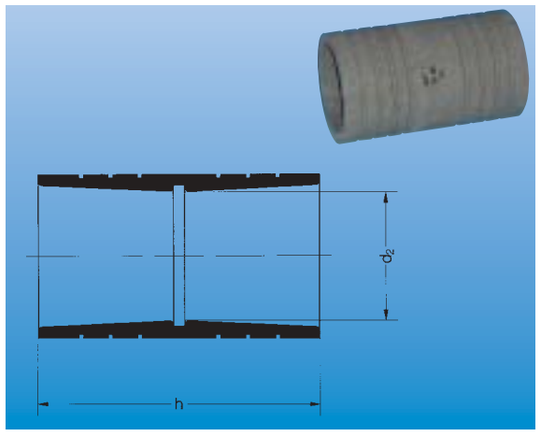
DN/OD	d_1	d_8	h	kg
160	160	194	207	1,070
200	200	250	248	1,976

Connecting socket to concrete pipe

DN/OD 160

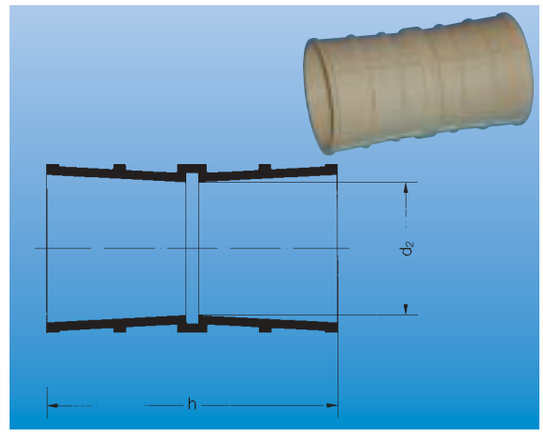
Drilling tool

Spanner



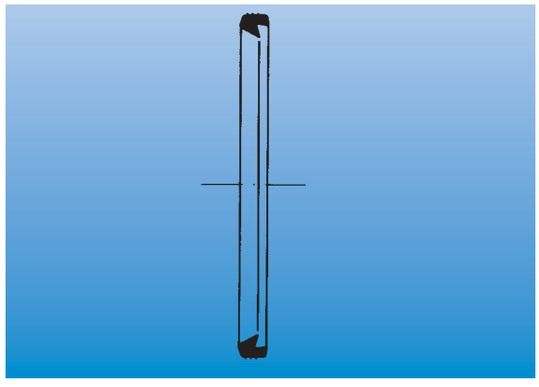
Wall seals in fibre-cement (FC)
KGF

DN/OD	d_2	h	kg
110	110,4	240	2,500
125	125,4	240	3,500
160	160,5	240	4,300
200	200,6	240	6,000
250	250,6	240	9,500
315	315,7	240	10,300
400	400,8	240	14,500
500	501,0	240	27,800



Wall seals in plastic
test mark PA-I 2236
KGF

DN/OD	d_2	h	kg
110	110,4	240	0,548
125	125,4	240	0,660
160	160,5	240	0,850
200	200,6	240	1,120
250	250,6	240	1,610
315	315,7	240	2,398
400	400,8	240	2,150
500	501,5	240	3,500



Lip ring seal, system BL
Shore-hardness A: 60 ± 5 degrees; test mark PA-I 3336

DN/OD	110	125	160	200	250	315	400	500

Lip ring seal, mineral oil permanent
Shore-hardness A: 60 ± 5 degrees; test mark PA-I 3336

DN/OD	110	125	160	200	250	315	400	500

KG-connecting socket (pipe saddle)

DN/OD	250/160	315/160	400/160	500/160

Spanner

Drilling tool

Lubricant, cleaner, adhesive

Lubricant	150 g / 250 g / 500 g / 1000 g - tube
Tangit-special-cleaner	1000 g - can
Tangit-special-adhesive	1000 g - can

Important Instructions for Laying

Application
Omniplast drainage/sewage pipes and fittings of PVC-U are used for conducting waste/sewage waters, i.e. for outside diameters d_1 110 to 200 mm for discharges with temperatures not constantly higher than 60°C, and for outside diameters d_1 250 to 500 mm for discharges with temperatures not constantly higher than 40°C. In addition, the sewage water should not contain substances which PVC-U is unable to resist.

Application
The subject of these instructions is the underground installation of Omniplast drain and sewer pipes and fittings in PVC-U with push-fit sockets, manufactured in accordance with DIN EN 1401 and for Omniplast drain and sewer pipes =System Bipeau SN 4=.

Quality assurance
Omniplast pipes and fittings are in accordance with the basic rules for construction and testing and bear the quality mark „DIN plus" of DIN CERTCO (Association for Quality Control)

Statics, check calculations
Use of Omniplast drain and sewer pipes and fittings in PVC-U is permitted without the need of calculating statics whenever the following conditions are met:

1. Minimum depth of cover of 1 m below traffic surfaces with traffic loads not exceeding 30 tons.
2. Minimum depth of cover of 0.80 m below traffic-free areas or surfaces, only temporarily exposed to light wheel loads.
3. Maximum depth of cover of 6 m for installation in trenches with the minimum width required by VOB, and/or 3.50 m (4 m below traffic surfaces), for installation under embankments or in very wide trenches.
4. Type of fill soil: as laid down in DIN 1055, part 2, tables 1 and 2 with characteristics cal $\gamma \leq 20.5$ kN/m^3, cal $\varphi \geq 22.5°$.Storage conditions as laid down in DIN EN 1610, section 7.2.

Should laying conditions deviate in one or more points from the above, statics have to be checked and calculated.

When establishing the load or soil bearing capacity and the extent of deformation, consideration should be given to the soil-mechanical properties of the bedding material. Basic calculations for statics, to be made with regard to varying conditions of bedding and filling, may be found in ATV work sheet A 127.

Overview
All rules generally applicable to pipe installation must be observed. Careful and proper handling of pipes during transport, storage and laying is of particular importance. Laying should be done only by personnel with special experience in the laying of plastic pipes.

Safety regulations
The following rules must be observed when laying pipes: accident prevention rules of the trade associations and all relevant provisions of applicable rules and technical procedures, traffic regulations and possible special rules issued by bodies involved in the project.

Transport and storage

Careful handling of pipes during transport, storage and laying is essential for an long-lasting trouble-free service. Improper transport or storage may cause deformation or damage to Omniplast sewer pipes, fittings and seal rings, which in turn lead to problems during laying und can affect the functioning of installed pipes. Therefore, please observe all of the following instructions.

a) Transport

Loose pipes should be supported along their entire length and be secured against position changes. Bending and significant mechanical impact (such as dropping, abrupt lifting or lowering as well as sudden putting down of the pipes) must be avoided. This especially applies for temperatures around 0 °C.

aa) Bundled Omniplast sewer pipes

Load and unload pipes on the construction site under the supervision of skilled personnel. Never throw pipes or drag them over the ground. Suitable transport vehicles (such as forklift trucks with wide fork bases) must be used for loading and unloading bundled pipes.

Loose Omniplast sewer pipes and fittings
Load and unload Omniplast pipes and fittings manually. Never unload pipes by tipping out or throwing them from the transport vehicle.

b) Storage of pipes
Pipes must be stored on a level surface. The staggered positions of the sleeves ensure an almost complete support of the pipe layers. If the pipes are stacked using wooden boards between them, these boards must be of a minimum width of 100 millimetres. The boards must be thick enough to provide space for the sleeves. The intermediate boards should be located about 1 metre from the pipe ends. Pipes and accessories must be stored far enough from the pipe trench to avoid any undue load to the trench walls. Pipes, fittings and seal rings must be stored so as to prevent contact with harmful substances.

ba) Open-air storage

When stored outside buildings, care must be taken to protect pipes and fittings from strong insolation that might lead to deformation. Unprotected storage of PVC-U pipes and fittings must not exceed two years. Any colour changes of the material (due to UV radiation) occurring during this time do not affect their proper functioning. If a longer unprotected storage cannot be avoided, please contact our application consultants for help. Seal elements should be stored in dark, dry and cool places.

bb) Securing the pipe stack

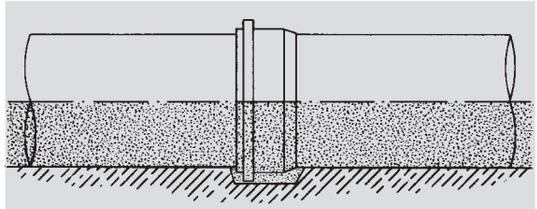
The pipes stacked in layers must be secured by means of vertical piles that must be wired to each other. The support piles must extend above the pipes of the top layer. For all nominal widths, the height of the stack should not exceed 1.50 metres . Omniplast pipe packages can be stacked higher if the load of the bundles is taken up by the package material (such as wooden frames). In such cases, stacks may have a maximum height of 3.00 metres.

bc) Storage of fittings

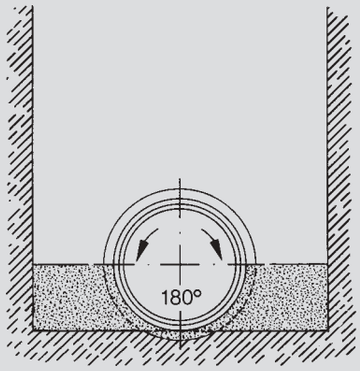
Cardboard boxes containing Omniplast sewer pipe fittings must be protected against humidity. The stacking height depends on the weight and stability of the cardboard boxes. For loose fittings stored outside, the remarks of section ba) must be followed.

Support surfaces and embedding

For underground installation, support surfaces and bedding of pipes and fittings in PVC-U are of special importance because of their "static, though flexible" properties. The job has to be carried out with great care, as laid down in DIN EN 1610, section 7.

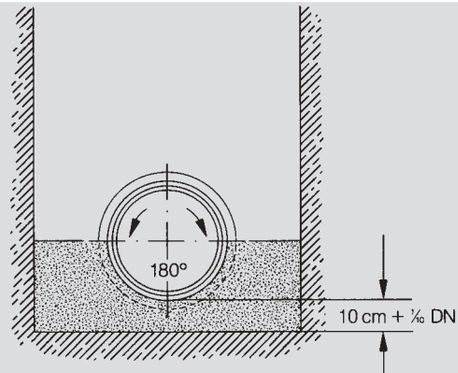


Carefully compacted sand bed in accordance with the Proctor method



Support surface of original soil

The quality of the compaction of the bedding material in the installation area (bottom of trench to no less than 30 cm above the pipes crown) and of the backfilling material above the level of the installation area depends on the observation of the requirements made with regard to the conditions of filling and bedding, and the types of soil, expressed in terms of simple Proctor density. For this purpose, four cases of filling conditions (A 1 - A 4), and four cases of specific bedding conditions (B 1 - B 4)) are cited below.



Support surface of sand and fine gravel

Filling conditions

A1 Trench filling in layers, compacted against the original soil (no need to submit proof of the degree of compaction).

A2 Vertical sheeting of trench with timbers or light-duty sheet-pile sections not to be removed before the work is finished, with slabs and other materials to be gradually withdrawn as the work proceeds, non-tamped trench filling, flushed-in filling (suitable for soils of group G1 only).

A3 Vertical sheeting of trench with sheet piling, wooden planks or other materials, not to be removed before the work is finished.

A4 Trench filling in layers compacted against the original soil. In this case, proof of the Proctor density required in accordance with the stipulations of ZTVE-StB has to be supplied. The filling conditions of case A4 do not apply to the soils of group G4).

Bedding conditions

B1 Layered bedding, compacted against the original soil or tamped-in sidefilling (no need to submit proof of the degree of compaction).

B2 Vertical sheeting within installation area with timbers or light-duty sheet-pile sections, not to be removed before the work is finished, with slabs and other materials to be withdrawn as soon as the compaction of the soil is ensured, or flushed-in filling (suitable for soils of group G1 only).

B3 Vertical sheeting within installation area with sheet piling, wooden planks, slabs or other materials, whenever further compaction after removal is not required.

B4 Bedding in layers, compacted against the original soil or tamped-in sidefilling. In this case, proof of the Proctor density required in accordance with the stipulations of ZTVE-StB has to be supplied. The bedding conditions of case B4 do not apply to the soils of group G4.

The filling conditions A1 - A4 may occur in a variety of combinations with the bedding conditions B1 - B4.

In the presence of ground-water, care should be taken to avoid displacement of the filling material (for example when bedding in gravel or concrete).

When installing underground pipes within buildings, a minimum cover of 15 cm above the socket is required. In cases where sockets are under direct load of building elements, ducts have to be installed or the pipes will have to be embedded in concrete. There is no reason why pipes should not be incorporated in floor slabs or foundations slabs. The socket gaps, however, should be sealed with adhesive tape to prevent the entry of cement grout which might adversely affect the operation of the joint.

Additional forces, likely to become active in sloping lines or in steeply inclined and vertical lines, have to be balanced by providing concrete supports, concrete beds or by using shutterings, which at the same time will serve as protection from washing out or drainage of the supporting bed.

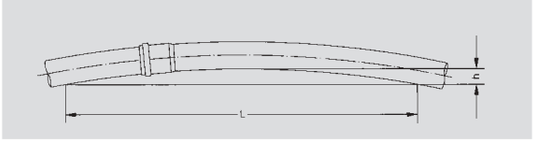
Special laying scenarios

If, for technical reasons, parts of the pipe are installed in a vertical position, the entire pipe section must be embedded in concrete. The instructions given in the previous section apply here as well.

Embedding in concrete is not necessary if other suitable measures are taken to hold the pipes in place.
Additional forces that may occur in the case of suspended installations, steep sections and vertical pipe positions must be taken up by constructional measures, such as creating concrete beds, by concrete encasing or crossbeams, that at the same time protect the duct from being washed out or from the drainage effects caused by the support layer. Special seals must be used for lines to oil or grease separators. Please contact our application engineers for help.

Laying procedure

Each pipe and fitting has to be accurately aligned according to gradient and direction. A straight and continuous run within the gradient prescribed should be maintained. In order to avoid inadmissible stress, in exceptional cases deviations from the straight line are not allowed to exceed the gauge values "h" given in the table below for outside diameters 110 to 200:



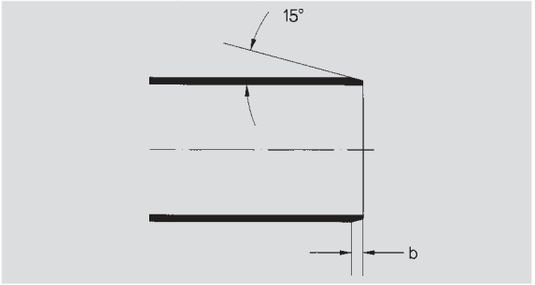
gauges h_{max} in m at a length of line L in m :

OD	r (m)	8	12	16
110	33	0,24	0,54	0,97
125	38	0,21	0,48	0,85
160	47	0,17	0,38	0,67
200	61	0,13	0,30	0,53

Pipes with outside diameters of 250 and more have to be installed in straight lines, free of stress.

Cutting to length and chamfering

The pipes are cut to length with a fine-toothed saw. A square cut will be achieved by using a guided saw (mitre box). For larger dimensions a cutting wheel may be used. The shortened pipe end has to be chamfered with a rough file or a bevelling tool, and deburred with a scraper. Fittings are not to be shortened.



DN		100	125	150	200	250	300	400	500
b	ca. mm	6	6	7	9	9	12	15	24

Distances between clamps in case of surface laying

When laid in or below buildings, the pipes must be fixed by means of clamps at specified distances.

To standardise the laying process, we recommend a distance between clamps of 2.50 metres for the dimensions DN 150 to DN 500 for the pipes of the =System Bipeau SN 4=.

Impermissible bending must be avoided. This also applies to installed fittings that must be suitably relieved.
In case of higher temperature differences, fixed-point clamps must be used every 5.00 metres, in order that possible thermal elongations can be taken up in the sockets. Installed fittings which usually cause a change of direction must be solidly supported due to the shearing forces that may occur. The clamps should be of a minimum width of 60 mm; the clamps must be deburred. An insert made of plastic or rubber is recommended to avoid extreme pressure on the edges.

When installing a pipeline the following steps have to be taken:

1 Cut the pipe at right angles to axis, using a guided saw.
2 Use a rough file and chamfer the shortened pipe end to an angle of approx. 15°...
3 ... and deburr. Fittings are not to be shortened.
4 After careful support of the pipeline, tamp
+ the bedding material in layers by hand.
5 Thoroughly compact the trench filling to a minimum height of 30 cm above the pipes crown.
6 Clean the outside of the spigot end and the inside of the socket and check position of ring seal.
7 Mark the socket depth on the spigot end - deduct 3 mm per meter of laying length but at least 10 mm - to indicate how far the spigot end has to be passed into the socket. Then thinly lubricate the chamfered surface of the spigot end. Do not use fat or oil.
8 Push the pipes spigot end into the socket until
+ the marking line is reached. Fittings are to be
9 fitted in the same way.

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Connecting sewer pipes and fittings to structures

Joints must be used for connections to structures, such as chambers. For this purpose, chamber casing made of fibre cement or plastics must be used, since PVC pipes do not bond with mortar or concrete.

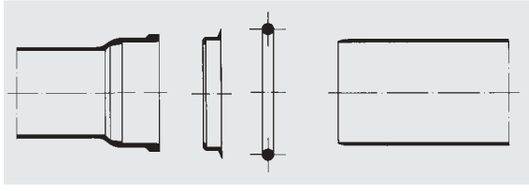
A seal ring chamber inside the shaft casing accommodates the lip seal.
Installation must be so that the spigot end of the pipe and the chamber casing are flush.

Wall seals in fibre-cement

Wall seals in plastics

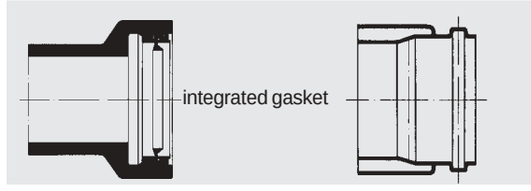
Jointing to pipes and fittings made of other materials

Material to be connected	Sealant	Omniplast Sewer Pipe Adaptors in PVC-U
Cast iron socket	double seals (GA-Set)	PVC sewer pipe spigot ends



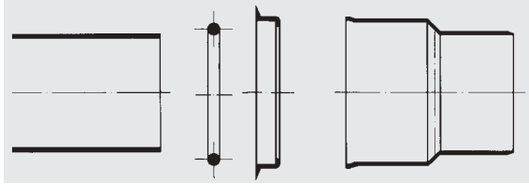
Jointing of Omniplast sewer pipes and fittings to cast iron sockets. A cast iron pipe ending in a socket will be connected to the spigot end of a pipe or fitting in PVC-U with double seals (GA-Set). Seal "K" should be used for outside diameter 125. For outside diameter 200 an adaptor has to be fitted to the cast iron pipe socket.

Material to be connected	Sealant	Omniplast Sewer Pipe Adaptors in PVC-U
vitrified clay pipe with push-fit socket "L"		adaptors for vitrified clay pipe sockets



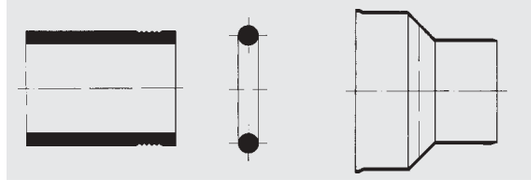
Jointing of Omniplast sewer pipes and fittings to vitrified clay pipes with push-fit socket "L".
A vitrified clay pipe ending in a push-fit socket, type "L", will be connected to the PVC-U pipe with the "adaptor for vitrified clay pipe sockets". The adaptor is inserted into the push-fit socket "L", additional sealing is not required.

Cast iron spigot end	double seals (GA-Set)	adaptors for cast iron pipe spigot ends



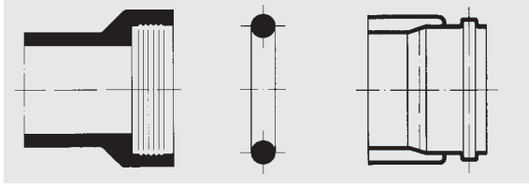
Jointing of cast iron pipe spigot ends to Omniplast sewer pipes and fittings.
A cast iron pipeline ending in a spigot end will be connected to the PVC-U pipe with the "adaptor for cast iron pipe spigot ends". The joint is sealed with the double seals (GA-Set).

vitrified clay pipe spigot ends	vitrified clay pipe special ring seal	adaptors for vitrified clay pipe spigot ends



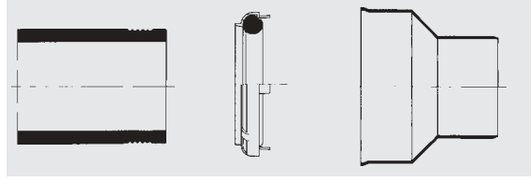
Jointing of vitrified clay pipe spigot ends to Omniplast sewer pipes and fittings.
A vitrified clay pipe ending in a spigot end will be connected to the PVC-U pipe with the "adaptor for vitrified clay pipe spigot ends". The joint is sealed a) with the vitrified clay pipe special ring seal. The vitrified clay pipe spigot end, fitted with the special ring seal, is pushed into the adaptor.

vitrified clay pipe socket for special ring seal	vitrified clay pipe special ring seal	adaptors for vitrified clay pipe sockets



Jointing of Omniplast sewer pipes and fittings to vitrified clay pipe sockets.
A vitrified clay pipe ending in a socket will be connected to the PVC-U pipe with the "adaptor for vitrified clay pipe sockets". The joint is sealed with the vitrified clay pipe special ring seal to be pushed on the adaptor and inserted into the socket.

vitrified clay pipe spigot ends	push-fix ring	adaptors for vitrified clay pipe spigot ends



b) The joint is sealed with the "push-fix ring". The outside of the spigot end and the inside of the adaptor are to be cleaned. Next, the "push-fix ring" with its flexible clamping device is inserted into the adaptor. The spigot end of the vitrified clay pipe can be passed through the "push-fix ring" into the adaptor until fully home.

Subsequent installation of a branch

A branch may be fitted in two ways:

a)
a section of the pipe (laying length of the fitting plus approx. twice the pipes outside diameter) is removed. Thereby 2 d_1 becomes the piece to be fitted in (pictures 1-3).
The pipe ends are deburred and chamfered. The branch is then pushed on. Double socketed sleeves are placed over the second pipe end and the piece to be fitted in - the line is closed again (pictures 4-6).


picture 1


picture 2


picture 3


picture 4


picture 5

picture 6

b)
a section is removed from the pipeline (length of branch plus approx. one fifth of the pipes outside diameter):

DN	100	125	150	200	250	300	400	500
$\frac{d_1}{5}$	22	25	30	40	50	60	80	100

ca. mm

Both pipe ends are deburred and chamfered. A double socketed sleeve is pushed over one end, while the other pipe end is raised and the branch pushed on (pictures 1-3). The double socketed sleeve is then pushed over the gap - and the connection is made (pictures 4-5).

picture 1

picture 2

picture 3

picture 4

picture 5

Installation of a saddle piece

Use in sewer pipes =System Bipeau SN 4=

1 Clean the outer pipe wall next to the connection point. Mark the connection point with a pen. Drill into the pipe using a bore-type cutter with a diameter of 168 mm (available as accessory part).

2 Deburr the drill hole.

3 Put the saddle piece in place. Screw on the saddle piece (a ring spanner is available as an accessory part).

4 Check the proper seat of the saddle piece. Connecting the line.

Installation of a DN/OD 160 concrete connecting sleeve

Application in sewer pipes (solid wall) and sewer pipes =System Bipeau SN 4= to concrete pipes ≥ DN 300 according to DIN 4032 and DIN 4035.

1 Drill a circular hole with a diameter of 165.0 – 166.5 mm. Due to the smooth cutting surface required, a diamond drill must be used.

2 Remove the drill core.

3 Completely release the knurled nut of the connecting sleeve.

4 Apply Omniplast lubricant to the thread and to the bottom side of the nut.

5 Insert the connecting sleeve into the circular hole.

6 Use the spanner that comes with the product to tighten the nut. Ensure that the connecting sleeve remains stationary while tightening. Tighten the nut until the first turn of the thread becomes visible.

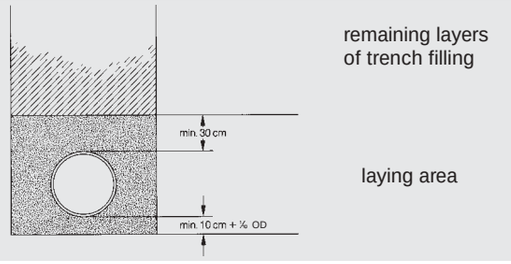
7 Before mounting the connecting pipe, apply Omniplast lubricant to the seal ring of the connecting sleeve.

Remark:

The connecting sleeve is sealed in transparent film, which carries the instructions for assembly together with a sketch of the part. If the mounting spanner is not included in the supply, it can be requested from us. The required diamond drill is available from specialised vendors.

Backfilling/compacting

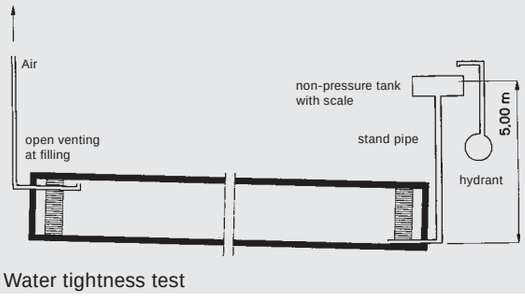
DIN EN 1610, Section 10 specifies the use of loose, stoneless, compactable material in the pipe section (pipe trench bottom up to at least 10 centimetres above the pipe).
Compacting directly contributes to increasing the stability of the lines laid and must be carried out with care. Each layer must be compacted individually. Backfilling of the trench and compacting of the soil must be done simultaneously on both sides of the line. The bedding material must be poured in layers of up to 30 centimetres and compacted manually or with light machinery, if possible, on both sides at a time in order to prevent the line from being displaced and from swelling.



Tightness test (water, air)

Tightness tests are done in accordance with DIN EN 1610, Section 13.

During the water tightness test, the line must be subjected to an internal pressure of 0.5 bar (with a 5 m water column) for one hour. In case of water losses, the line must be filled up. No water loss is allowed to occur during the subsequent test stage of 15 minutes, during which a test pressure of 0.5 bar (5 m water column) is applied.
Before the beginning of the test as well as during the test itself, the line must be under water and air, and all feeders must be securely closed.



Water tightness test

If the tightness test is to be done with air, the following procedure applies:

The test conditions for pipelines (without shafts) taking into account test procedures and nominal widths can be found in the following table. The procedure should be selected by the customer. Special care is necessary during the test due to an increased risk of accidents. A tight and proper seat of the gate valves is essential.

The initial pressure must exceed the required test pressure p_0 by about 10%; this pressure must be maintained for about 5 minutes.
Then the pressure stated for the procedure and nominal width in question must be applied. The pressure drop must be recorded. If the pressure drop exceeds Δp, the test must be repeated. After Δp has been exceeded several times, tightness must be verified by means of a water pressure test.

proce-dure	pσ [mbar	Δp (kPa)]	test period for [min.]								
			DN 100	DN 125	DN 150	DN 200	DN 250	DN 300	DN 400	DN 500	DN 600
LA	10 (1)	2,5 (0,25)	5	5	5	5	6	7	10	12	14
LB	100 (10)	15 (1,5)	4	4	4	4	5	6	7	9	11
LC	300 (5)	50 (30)	3	3	3	3	3,5	4	5	7	8
LD	200 (20)	15 (1,5)	1,5	1,5	1,5	1,5	2	2	2,5	3	4

test pressure, pressure decrease and test periods for the test with air

Tightness test for chambers

The tightness test for the shafts should preferably be carried out as a water pressure test. The shaft is filled with water up to 0.5 metres above the pipes of the surrounding sewage lines and ducts. Within the test period of 30 minutes, the water supply required to maintain the water pressure is not allowed to exceed 0.4 litres per square metre of covered shaft wall (including the shaft bottom).

Connection to collection chambers

The same instructions and procedures as for making the push-fit socket connection must be followed.

Connection to pass chambers

The same instructions and procedures as for making the push-fit socket connection must be followed.

Demands on Omniplast Sewer Pipes PVC-U acc. to DIN EN 1401 and on Omniplast Sewer Pipes PVC-U = System Bipeau SN 4 =

Property	DIN EN 1401	= System Bipeau SN 4 =
material	uPVC without fillers acc. to DIN 8061	uPVC mod.
delivery condition	pipes and fittings have to be seamless - pipe ends cut at right angles to pipe axis - pipes have to be straight and perfectly circular; fittings must not show any sunk spots	+
strength properties at internal pressure test	σ = 10 N/mm^2 T = 60° C t = ≥ 1000 h	σ = 16 N/mm^2 T = 20° C t = ≥ 1 h
behaviour after heat treatment	pipes: changes in dimensions ≤ 5 % fittings must not show bubbles, blisters or cracks	+
water-proof	pipes and fittings must not leak at a test pressure of 0 bar up to an excess pressure of 0,5 bar	+
surface condition	inner and outer surface of pipes and fittings have to be smooth - slightly shallow grooves and waves are permissible provided that they do not fall below the minimum values of the wall thickness - inadmissible are at any rate sunk spots and sharp-edged grooves	+
strength properties at impact strength test	failure ≤ 10 % method: Charpy at 20° C	failure ≤ 10 % falling ball test at 0° C
Vicat softening temperature	pipes: VST/B/50 ≥ 79° C fittings: VST/B/50 ≥ 77° C	test is executed on especially produced test specimen +
root resistance	+	+
behaviour of sealing during installation	+	+
colour	coloration of pipes and fittings has to be even and equal and must show the colour red-brown according to RAL 8023	+
dimensions	outside diameter d_1	+
	tolerance d_1	+
	wall thickness s_1	+ 1)
	tolerance s_1	+
	socket inside diameter d_2	+
	tolerance d_2	+
	groove inside diameter r d_3	+
	tolerance d_3	+
	z-dimensions for fittings	+
	socket dimensions	+
sulphate ash content	≤ 6 %	has to remain as determined during first test
delivery condition	pipes and fittings which show bubbles, blisters, non-homogeneities, or which are resp. not evenly coloured are to be picked out	this requirement applies for the inner and outer wall; for the core applies the test "structural homogeneity".

+ = requirements are the same for both types of pipe.

1) wall thickness of DN 100 to DN 200 according to Approval No. Z-42.1-101;
DN 250 to DN 500 according to DIN EN 1401

1

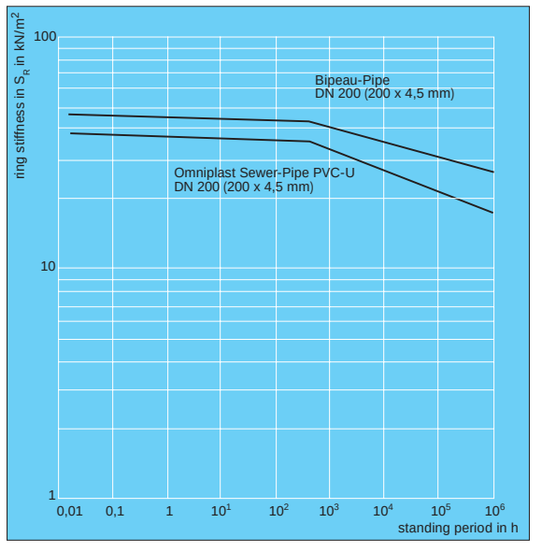
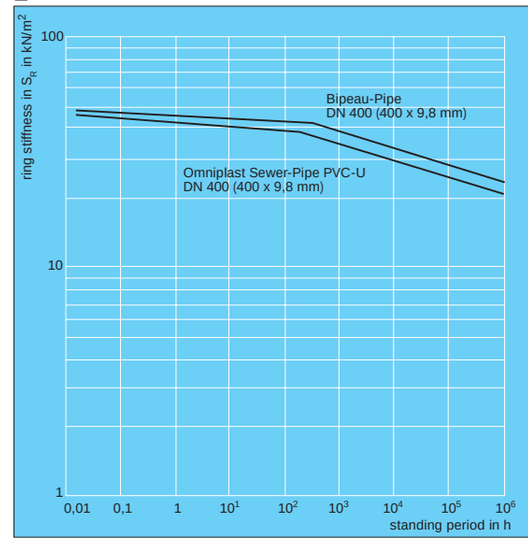


Diagram 1
Measuring of ring stiffness in S_R in kN/m², on sewer pipes acc. to DIN V 19534, on dimension DN 200 (200 x 4,5 mm) and on Bipeau-pipes DN 200 (200 x 5,4 mm), SN 4.

Diagram 2
Measuring of ring stiffness in S_R in kN/m², on sewer pipes acc. to DIN V 19534, on dimension DN 400 (400 x 9,8 mm) and on Bipeau-pipes DN 400 (400 x 10,8 mm), SN 4.

2



The diagrams indicate the course of ring stiffness S_R measured on pipes of DN 200 and DN 400.

Initial deformation:
3% (average modification of pipes outside diameter in vertical direction Δd_{1v}). The test had been effected for ≥ 20.000 h. Then the value for 50 - ($\Delta \geq$ 438.000 h) resp. 100 years - ($\Delta \geq$ 876.000 h) of the ring stiffness had been determined by means of the linear regression by extrapolation.

3

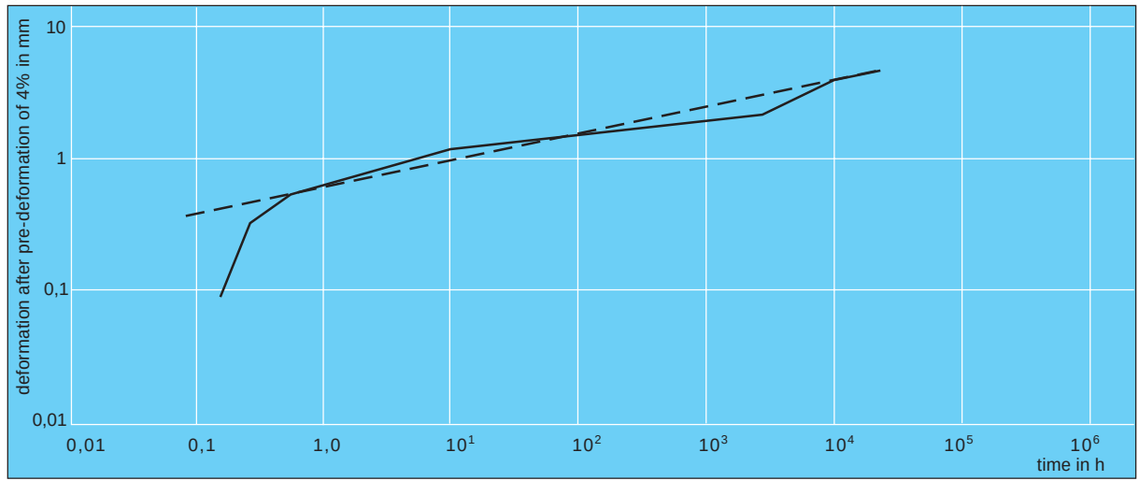


Diagram 3
Sandpit-test
Measuring of deformation of an Omniplast sewer pipe =System Bipeau= DN 250 (250 x 6,1 mm) starting at a pre-deformation of 4%.

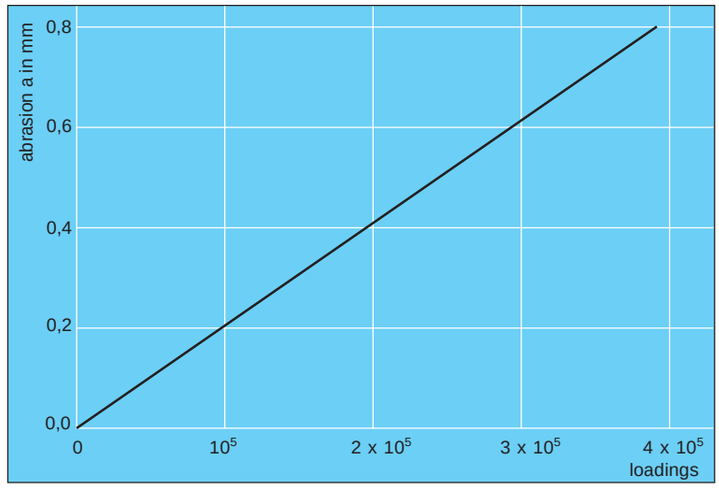
The sandpit-test is described in standard 19566, part 2.
The test had been executed for ≥ 20.000 h.

The constant compression load onto the pipe is executed by means of a pressure plate on the sand bedding. The test had been started with an initial deformation of 4%.

The absolute deformation Δd_{1v} in mm had been measured afterwards over the whole test period.

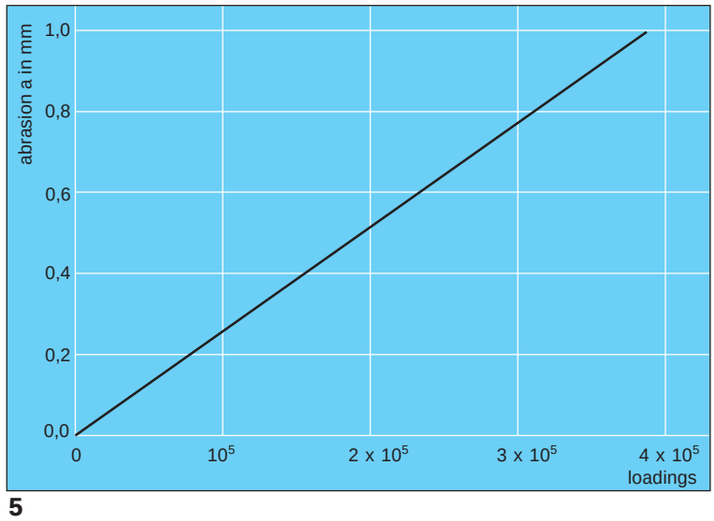
After ≥ 20.000 h the value per 50 resp. 100 years of the absolute vertical change in diameter had been determined by means of the linear regression by extrapolation.

Every 1960 h, the media had a temperature of 45° C for the period of 40 h.



4

Diagram 4
Abrasion test executed on an Omniplast sewer pipe = System Bipeau = DN 250 (250 x 6,1 mm) acc. to procedure Darmstadt.



5

Diagram 5
Abrasion test executed on an Omniplast sewer pipe = System Bipeau = DN 250 (250 x 6,1 mm) with turned out inner layer acc. to procedure Darmstadt.

Abrasion resistance is tested acc. to the test methods described in DIN 19566, part 2, resp. DIN V 19534, part 2.

The abrasion resistance is tested up to 400.000 loadings. The test was carried out at the compact inner layer of the pipe as well as at the closed-pored cellular core. It was demonstrated that the abrasion resistance of the closed-pored cellular core is corresponding to that of compact uPVC. As for the abrasion resistance, the abrasion value a_m after 100.000 loadings is the test result.

Standards and Work Sheets

DIN EN 476
General requirements for components for sewers and drainage lines for gravity-driven sewerage systems

DIN EN 681-1
Elastomer seals
Material requirements for pipeline seals for applications in water supply and drainage; Part 1 – Vulcanised rubber

DIN 1054
Subsoil; Permissible Loading of Subsoil
Supplement - Comments

DIN 1055, Part 2
Design Loads for Buildings; Soil Characteristics, Specific Weight, Angle of Friction, Cohesion, Angle of Wall Friction

DIN 1072
Road and Foot Bridges; Design Loads
Supplement 1 - Road bridges; design loads; explanations

DIN EN 1401-1
Plastic pipe systems for buried pressure-less sewers and drainage lines - unplasticized polyvinylchloride (PVC-U) - Part 1:Requirements for pipes, fittings and the pipeline system

DIN EN 1610
Laying and testing of drainage lines and sewers

DIN 1960
Contract Procedure for Building Works, Part A: General provisions for allocating orders on construction services

DIN 1961
Contract Procedure for Building Works, Part B: General contractual conditions for the carrying out of construction services

DIN 1986
Drainage and Sewerage Systems for Buildíngs and Plots of Land;
Part 3 - Specifications for Service and Maintenance
Part 4 - Fields of Application of Sewage Pipes and Sewage Fittings Made from Different Materials

DIN 2401
Part 1 - Components exposed to internal or external pressure; pressure and temperature data, definitions, nominal pressure levels

DIN 2402
Pipelines; nominal widths, definition, steps

DIN 2403
Identification of pipelines according to fluid conveyed

DIN 2429
Graphical symbols for technical drawings
Pipe systems overview

DIN 4045
Sewage systems; definitions

DIN 4050
Drawings of existing public sewers

DIN 4060
Elastomer seals for pipe joints in drain and sewers; requirements and testing
DIN 4068
Waste water; identification labels

DIN 4124
Building Pits and trenches; Slopes, working space widths; sheeting

DIN 7716
Caoutchouc and rubber products; storage, cleaning and maintenance requirements

DIN 8061
Supplement 1 - Unplasticized polyvinylchloride pipes; chemical resistance of pipes and fittings of PVC-U

DIN 8062
Unplasticized polyvinylchloride pipes (PVC-U); dimensions

DIN EN 12056
Gravity-driven drainage systems in buildings
Part 1 - Range of application, definitions, general requirements and requirements for implementation
Part 2 - Planning and calculation of sewage plants
Part 3 - Planning and calculation of roof drainage systems
Part 4 - Planning and calculation of sewage lifting systems
Part 5 - Installation, maintenance and operating instructions
Part 6 - Acceptance and testing

prEN 13476-1
Plastic pipeline systems for buried sewers and drainage lines - pipeline systems with profiled walls made of unplasticized polyvinylchloride (PVC-U), polypropylene (PP) and polyethylene (PE)
Part 1 - Requirements for pipes, fittings and the pipeline system

DIN 16928
Pipelines made of thermoplastic plastic, pipe connections, pipeline components, laying, general provisions

DIN 16961
Part 1 - Pipes and fittings made of thermoplastic plastic, with profiled walls and smooth internal surface, dimensions
Part 2 - Pipes and fittings made of thermoplastic plastic, with profiled walls and smooth internal surface, technical delivery conditions

DIN 18300
Contract Procedure for Building Works
Part C: General Technical Specifications for Building Works; Earthworks

DIN 18303
Contract Procedure for Building Works
Part C: General Technical Specifications for Building Works; Sheetworks

DIN 18303
Contract Procedure for Building Works
Part C: General Technical Specifications for Building Works; watering works

DIN 18306
Contract Procedure for Building Works
Part C: General Technical Specifications for Building Works; Drainage and Sewage Channel Works

DIN 18381
Contract Procedure for Building Works
Part C: General Technical Specifications for Building Works; Installation works for gas, water supply and drainage systems

DIN 19525
Sewage; Guidelines for working on drafts

DIN V 19534
Part 1 - Pipes and Fittings of Unplasticized Polyvinylchloride (Rigid PVC) with Plug Socket for Sewerage Pipes and Lines; Dimensions

Part 2 - Unplasticized polyvinylchloride (PVC-U) socket pipes and fittings for drains and sewers; technical delivery conditions

DIN 19534-3
Pipes and fittings of unplasticized polyvinylchloride (rigid PVC) with push-fit socket for sewage pipes and lines;
Part 3 - Quality monitoring and carrying out of construction

DIN 19566
Part 1 - Pipes and fittings made of thermoplastic plastic, with profiled walls and smooth internal surface, for sewers and drainage lines; dimensions
Part 2 - Pipes and fittings made of thermoplastic plastic, with profiled walls and smooth internal surface, for sewers and drainage lines; general requirements, tests

DIN 19568-100
Plastic pipeline system for buried sewers and drainage lines made of unplasticized polyvinylchloride (PVC-U), polypropylene (PP) and polyethylene (PE) with profiled walls and smooth internal surface
Part 1 - Requirements for pipes, fittings and the pipeline system

ATV Regulations - Sewage- Work Sheet A 127
Draft-Guidelines for the Calculation of Static of Drainage Ducts and Lines

ATV regulations - Sewage - Work sheet A 139
Guidelines for the making of sewers and drainage lines

DVS 2204
Part 1 - Gluing of thermoplastic plastic;
Sheet 1: PVC - unplasticized

Certification programme ZP 7.1.15
Co-extruded, foamed-core pipes and fittings made of modified PVC-U with push-fit sockets for sewers and drainage lines with the Gütegemeinschaft Kunststoffrohre e.V quality mark.

Certification programme ZP 7.1.1/8
Pipes and fittings made of unplasticized polyvinylchloride (PVC-U) with push-fit sockets for sewers and drainage lines with the Gütegemeinschaft Kunststoffrohre e.V. quality mark; General

KRV A 7.1.2
Sheet 1 and 2
Pipes and fittings made of unplasticized polyvinylchloride (PVC-U) with push-fit sockets for sewage ducts and lines; dimensions in mm

KRV A 7.1.15, sheet 1 and 2
Co-extruded, foamed-core pipes and fittings made of modified PVC-U with push-fit sockets for sewers and drainage lines; Dimensions

KRV-Laying Instructions A 715
Laying Instructions for Underground Drain Pipes and Lines in Unplasticized PVC with Push-fit Sockets in accordance with DIN V 19534 and R 7.1.1/8

Memorandum on backfilling of line trenches.
(Issued by Forschungsgesellschaft für das Straßenwesen e.V., Köln [research association for road construction, Cologne])

VGB provisions
VGB 1 - General provisions
VGB 37- Construction works (with implementation procedures, dated 25 April, 1985)
(Issued by Hauptverband der gewerblichen Berufsgenossenschaften [organisation of trade associations])

ZTVE-StB 76
Additional Technical Rules and Regulations for Ground works in Road Construction; issued by the German Federal Ministry for Transport, Road Construction Department

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Our products

Soil-Waste Sewer

Omniplast PVC-U sewer pipe programme (SN 4)

Omniplast PVC-U sewer pipe programme = System Bipeau SN 4 =

Omniplast PVC-U sewer pipe programme = System Bipeau plus SN 8 =

Omniplast inspection chamber programme DN 400

Omniplast road gully programme

Omniplast "rotstrichrohr" programme in PP
durably flame resistant, hot water resistant

Water supply

Omniplast PVC-U pressure pipe programme
with slip-on socket, system 3 s

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