

Entry manholes 1000

Description

Technical features

Entry manholes 1000

Main components of a chamber

-**base unit, a base of an entry manhole**, allowing for direct connection of storm water drainage or sanitary sewer systems installed in the ground, including incorporated channels with possible branches along with possible branches

-**shaft, a chamber built of modular PP sections**, of the internal diameter 1000, equipped with access steps

-**reduction cone PP 1000/600** allowing for adjustment of the manhole height. The cone is equipped with access steps



Standards:

-1000 inspection chamber is compliant with **PN-EN 13598-2:2009**

PN-EN 476:2011

-approval for use in road ROWs

Technical Approval **IBDIM AT/2010-02-2830**

Technical approval **IK AT/07-2011-0242-00**

Technical Approval **IBDIM AT/2011-02-2706**

-**GIG (Central Mining Institute) Opinion approving their use in the areas** of mining damages up to the 4th category

-Chemical resistance of chamber PP components to chemical substances is compliant with

the ISO/TR 10358 Guidelines

-Gully tops and manhole tops meet the requirements of standard

PN-EN 124:2000

-manhole steps meet the requirements of standard

PN-EN 13101:2005

-Seals meet the requirements of standard

PN-EN 681-1:2002

-Chemical resistance of elastomeric seals to chemical substances is compliant with

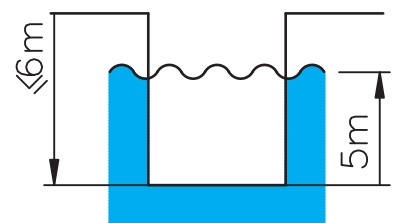
the ISO/TR 7620 Guidelines

Usage:

-maximum installation depth 6 m

-acceptable ground water table 5 m

-acceptable load caused by traffic SLW60 according to ATV-A127P



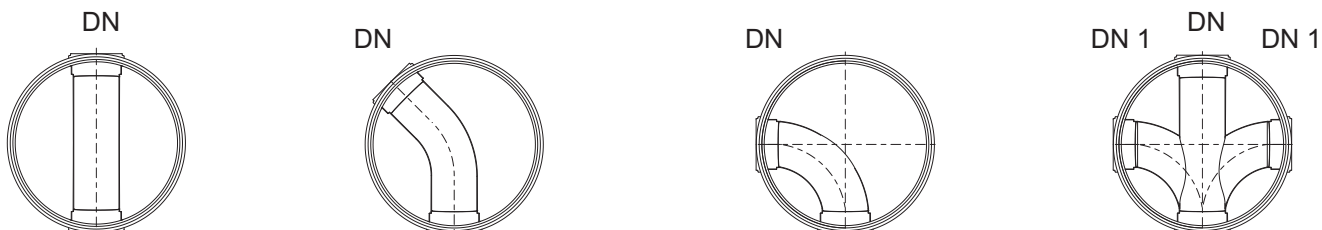
Entry manholes 1000

Solution options

Technical features

Technical data

Base units are made of polypropylene, with reinforcing ribs. They are adapted to connection with vertical riser pipes. There is a horizontal channel in the base unit with one or a few inlet connector pipes and one outlet connector pipe ending with bells for connection with plain wall pipes made of PVC-U, PP or PE or connector pipes adapted to connection with structural pipes K2-KAN.



Type 1 0°	Type 1 15°	Type 1 30°	Type 1 45°	Type 1 90°	Type 2 45° 90°		
DN	DN	DN	DN	DN	DN 1	DN	DN 1
200	200	200	200	200	200	200	200
250	250	250	250	250	250	250	250
315	315	315	315	315	315	315	315
400	400	400	400	400	400	400	400
500	500	500	500	-	-	-	-
200K2-Kan	200K2-Kan	200K2-Kan	200K2-Kan	200K2-Kan	200K2-Kan	200K2-Kan	200K2-Kan
250K2-Kan	250K2-Kan	250K2-Kan	250K2-Kan	250K2-Kan	250K2-Kan	250K2-Kan	250K2-Kan
300K2-Kan	300K2-Kan	300K2-Kan	300K2-Kan	300K2-Kan	300K2-Kan	300K2-Kan	300K2-Kan
400K2-Kan	400K2-Kan	400K2-Kan	400K2-Kan	400K2-Kan	400K2-Kan	400K2-Kan	400K2-Kan
500K2-Kan	500K2-Kan	500K2-Kan	500K2-Kan	-	-	-	-
600K2-Kan	600K2-Kan	600K2-Kan	-	-	-	-	-

A ball-and-socket joints $\pm 7,5^\circ$ may be used in connection bells 160; 200; 250; 315 (page 28)

Height adjustment

Entry manholes 1000

Specifications and height adjustment

Preparing specifications for materials required for an investment, total numbers of individual inspection chamber components should be indicated:

-base units, -riser pipes, -tops

The input parameter is chamber height specified in the design – the distance between the ground level and the chamber invert (base unit level). We label it as **Hs**.

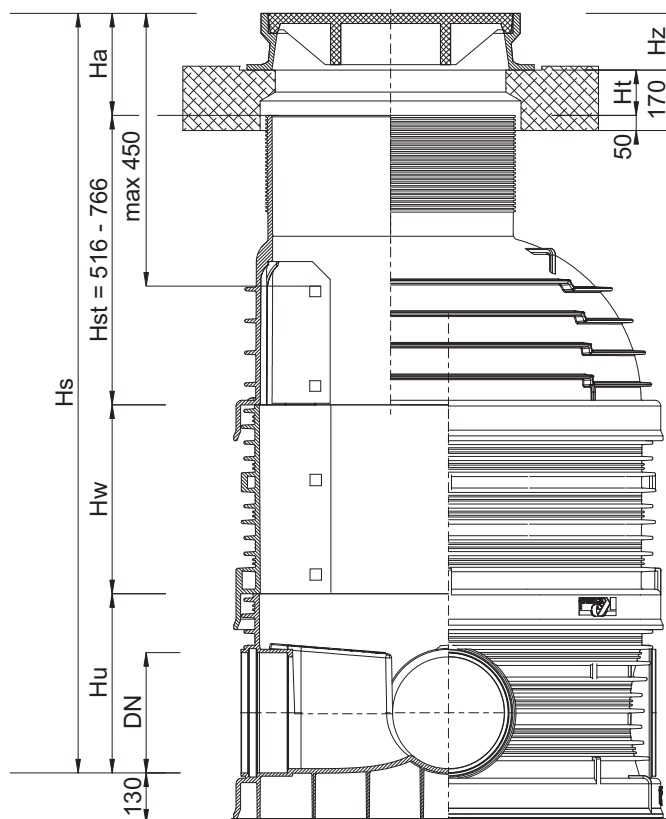
In order to make calculations easier, there is useful height (**Hu**) specified for each base unit type, that is, the distance between the bottom of a base unit and the bottom of base unit bell in which a riser pipe is installed.

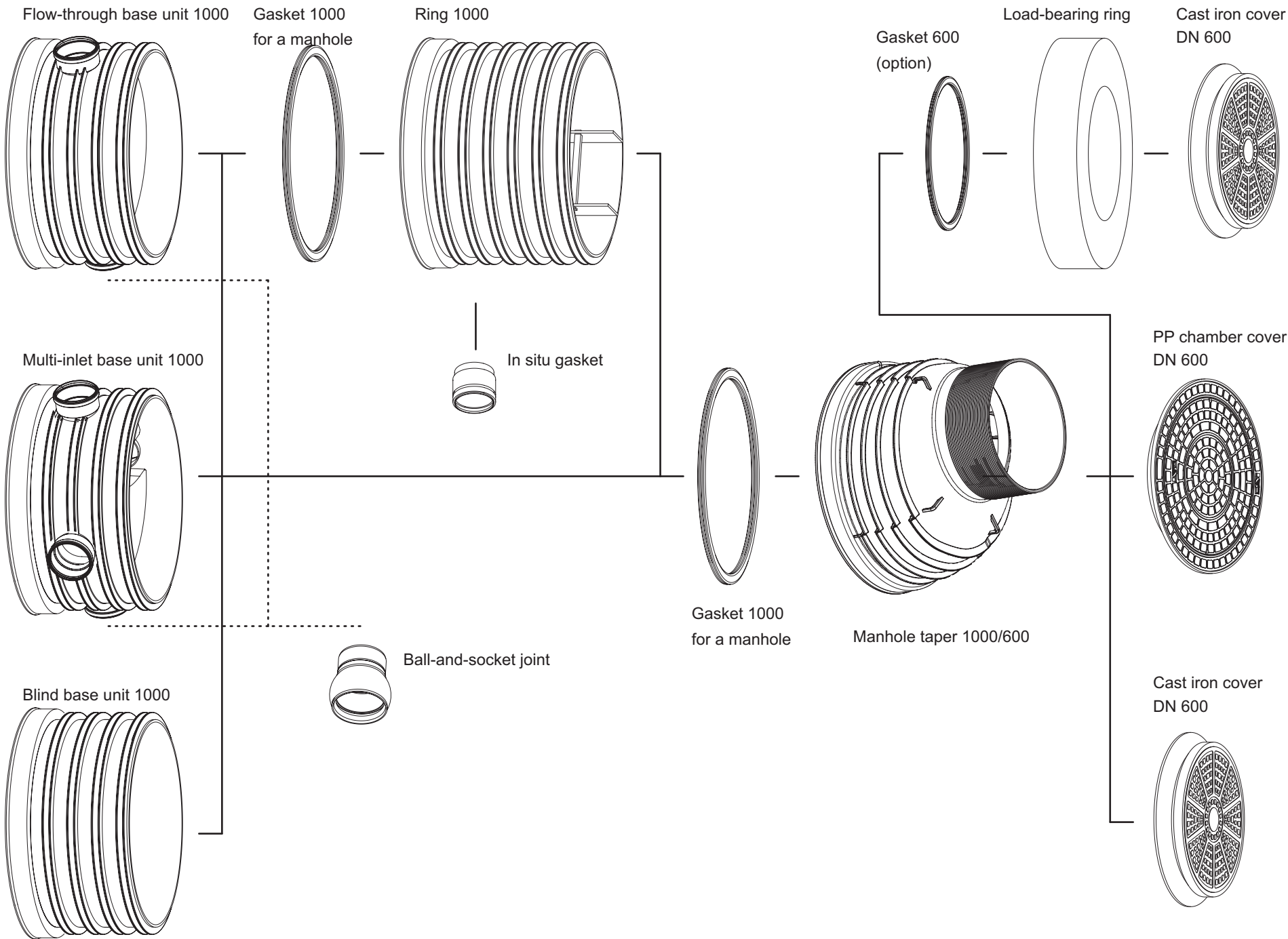
For calculations, we label the height of vertical chamber sections as **Hw**. Taper height will be **Hst**. The effective height of a top section (telescope) will be **Ha**.

Entry manhole 1000

$$H_s = H_u + H_w + H_{st} + H_a$$

$$H_a = H_t + H_z$$



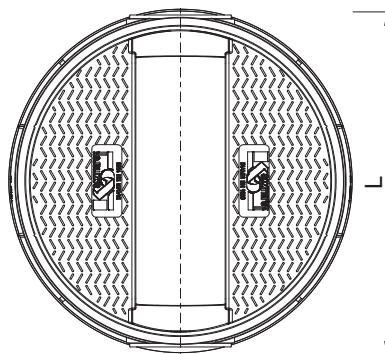
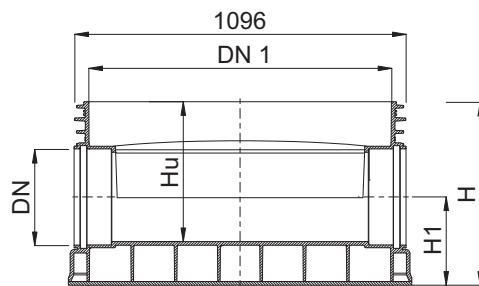


- Entry manhole 1000

Assortment

Flow-through base unit 1000

Type 1

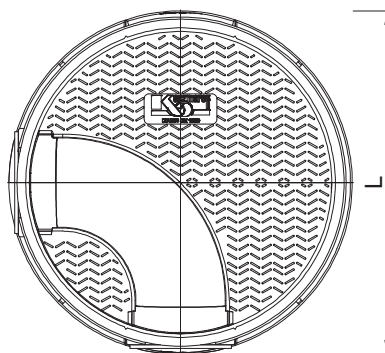
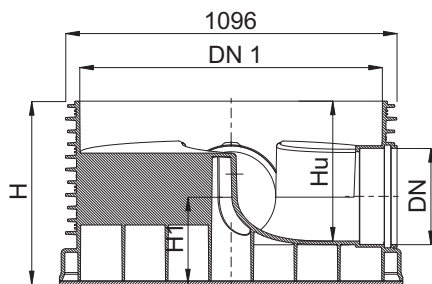


DN [mm]	DN 1 [mm]	H [mm]	Hu [mm]	H1 [mm]	L [mm]	Weight [kg]	index -
200	1000	595	444	252	1136	73,4	2631130030
250	1000	595	460	260	1136	76,4	2631140030
315	1000	595	475	280	1136	76,4	2631150030
400	1000	595	496	300	1440	91,6	2631160030
500	1000	845	665	440	1496	94,5	2631170030
200 K2 *	1000	595	438	259	1230	73,4	2631530030
250 K2 *	1000	595	432	291	1272	76,4	2631540030
300 K2 *	1000	595	435	320	1320	76,4	2631550030
400 K2 *	1000	595	495	382	1430	93,1	2631560030
500 K2 *	1000	845	658	440	1516	94,8	2631570030
600 K2 *	1000	845	665	498	1576	123,5	2631580030

* no gaskets in connection bells

Flow-through base unit 1000

Type 1



DN [mm]	DN 1 [mm]	H [mm]	Hu [mm]	H1 [mm]	L [mm]	Weight [kg]	index -
200x90°	1000	595	444	252	1136	73,8	2631139030
250x90°	1000	595	460	260	1136	76,8	2631149030
315x90°	1000	595	475	280	1136	76,4	2631159030
400x90°	1000	595	496	300	1440	91,6	2631169030
200K2-90° *	1000	595	444	252	1136	52,2	2631539030
250K2-90° *	1000	595	460	260	1136	55,0	2631549030
300K2-90° *	1000	595	475	280	1136	57,5	2631559030
400K2-90° *	1000	595	496	300	1440	91,6	2631569030

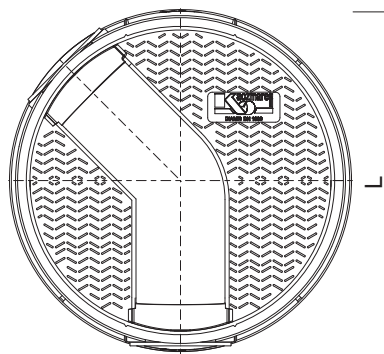
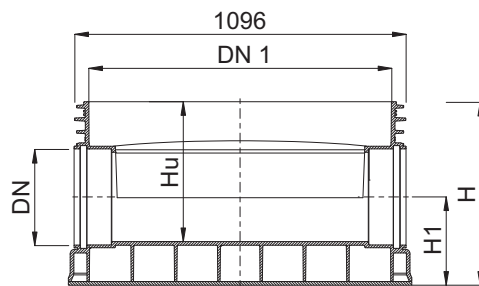
* no gaskets in connection bells

Entry manholes 1000

Assortment

Flow-through base unit 1000

Type 1



DN [mm]	DN 1 [mm]	H [mm]	Hu [mm]	H1 [mm]	L [mm]	Weight [kg]	index -
200x15°	1000	595	444	252	1136	73,8	2631131530
250x15°	1000	595	460	260	1136	76,8	2631141530
315x15°	1000	595	475	280	1136	76,4	2631151530
400x15°	1000	595	496	300	1440	91,6	2631161530
500x15°	1000	845	665	440	1496	94,5	2631161530
200K2-15° *	1000	595	444	252	1136	52,2	2631531530
250K2-15° *	1000	595	460	260	1136	55,0	2631541530
300K2-15° *	1000	595	475	280	1136	57,5	2631551530
400K2-15° *	1000	595	496	300	1440	91,6	2631561530
500K2-15° *	1000	845	658	440	1430	94,8	2631561530
600K2-15° *	1000	845	665	498	1516	123,5	2631561530
200x30°	1000	595	444	252	1136	73,8	2631133030
250x30°	1000	595	460	260	1136	76,8	2631143030
315x30°	1000	595	475	280	1136	76,4	2631153030
400x30°	1000	595	496	300	1440	91,6	2631163030
500x30°	1000	845	665	440	1496	94,5	2631163030
200K2-30° *	1000	595	444	252	1136	52,2	2631533030
250K2-30° *	1000	595	460	260	1136	55,0	2631543030
300K2-30° *	1000	595	475	280	1136	57,5	2631553030
400K2-30° *	1000	595	496	300	1440	91,6	2631563030
500K2-30° *	1000	845	658	440	1430	94,8	2631563030
600K2-30° *	1000	845	665	498	1516	123,5	2631563030
200x45°	1000	595	444	252	1136	73,8	2631134530
250x45°	1000	595	460	260	1136	76,8	2631144530
315x45°	1000	595	475	280	1136	76,4	2631154530
400x45°	1000	595	496	300	1440	91,6	2631164530
500x45°	1000	845	665	440	1496	94,5	2631164530
200K2-45° *	1000	595	444	252	1136	52,2	2631534530
250K2-45° *	1000	595	460	260	1136	55,0	2631544530
300K2-45° *	1000	595	475	280	1136	57,5	2631554530
400K2-45° *	1000	595	496	300	1440	91,6	2631564530
500K2-45° *	1000	845	658	440	1430	94,8	2631564530

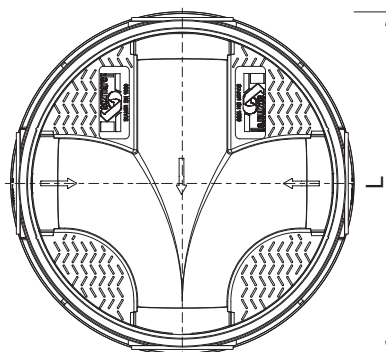
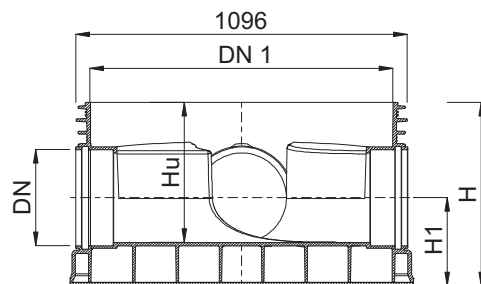
* no gaskets in connection bells

- Entry manholes 1000

Assortment

Multi-inlet base unit 1000

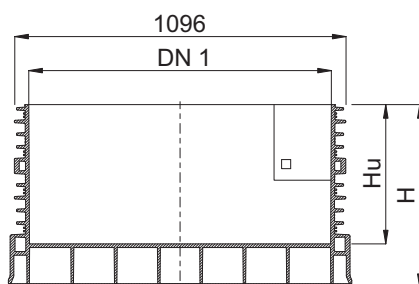
Type 2



DN [mm]	DN 1 [mm]	H [mm]	Hu [mm]	H1 [mm]	L [mm]	Weight [kg]	index -
200	1000	595	444	252	1136	52,9	2632139030
250	1000	595	460	260	1136	56,3	2632149030
315	1000	595	475	280	1136	59,3	2632159030
400	1000	595	496	300	1440	95,6	2632169030
500	1000	845	705	440	1496	101,3	2632179030
200 K2 *	1000	595	438	259	1230	53,3	2632539030
250 K2 *	1000	595	432	291	1272	57,1	2632549030
300 K2 *	1000	595	435	320	1320	60,2	2632559030
400 K2 *	1000	595	495	382	1430	97,7	2632569030
500 K2 *	1000	845	705	440	1516	103,4	2632579030

* no gaskets in connection bells

Blind base unit 1000

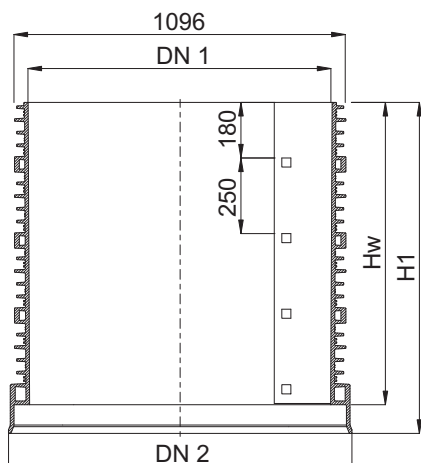


DN 1 [mm]	H [mm]	Hu [mm]	Weight [kg]	index -
1000	595	480	66,0	2630040030
1000	1095	980	82,5	2630080030

Entry manholes 1000

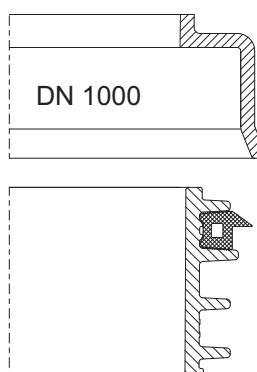
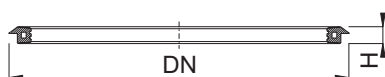
Assortment

Ring 1000



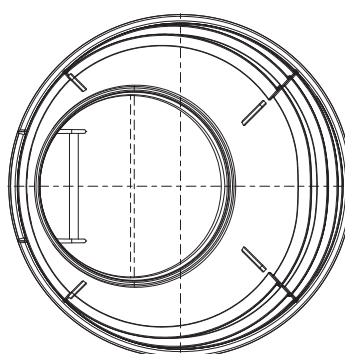
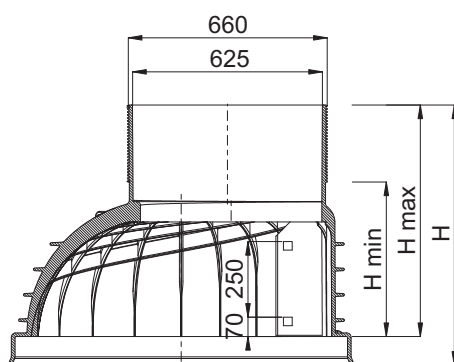
Hw [mm]	H1 [mm]	DN 1 [mm]	DN 2 [mm]	Weight [kg]	index -
250	345	1000	1136	21,0	2639120030
500	595	1000	1136	36,0	2639140030
750	845	1000	1136	52,5	2639160030
1000	1095	1000	1136	68,0	2639180030

Manhole gasket 1000



DN [mm]	H [mm]	Weight [kg]	index -
1000	30	3,8	5161231010

Manhole taper 1000



DN [mm]	DN 2 [mm]	H min [mm]	H max [mm]	H [mm]	Weight [kg]	index -
1000/625	1100	516	766	861	43,0	2639220030

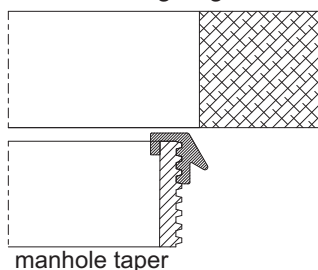
Entry manholes 1000

Assortment

Manhole gasket 1000/600 for a manhole taper

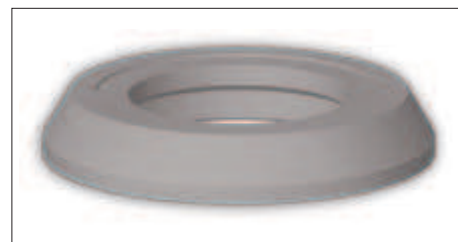
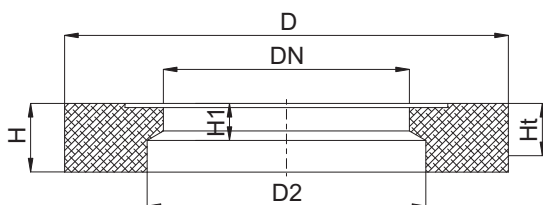


Load-bearing ring



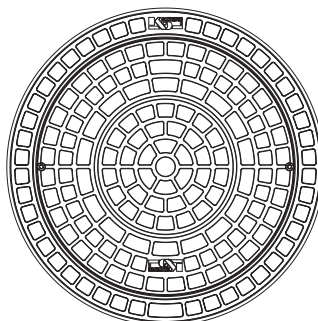
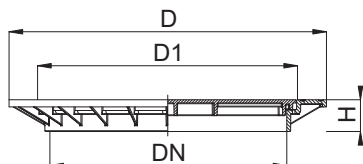
DN [mm]	H [mm]	Weight [kg]	index -
1000	30	2,1	5164181010

Load-bearing ring



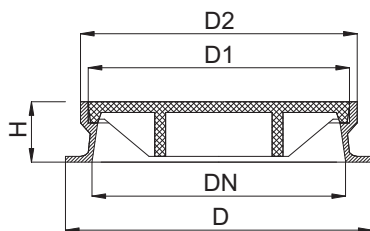
DN [mm]	D [mm]	D2 [mm]	H [mm]	H1 [mm]	Ht [mm]	Weight [kg]	index -
600	1100	690	170	90	120	220,0	2953184000

PP chamber cover DN 600



	DN [mm]	D [mm]	D1 [mm]	H [mm]	Weight [kg]	index -
A15	600	800	650	80	8,4	2589421090

Cast iron chamber cover DN 600



	DN [mm]	DN 1 [mm]	D1 [mm]	D2 [mm]	H [mm]	Weight [kg]	index -
A15	600	680	630	670	50	35,9	2901281500
B125	600	750	640	680	150	103,5	2901282500
C250	600	750	640	680	150	112,0	2901283500
D400	600	760	640	680	150	145,0	2901284500
D400 Gully grating	600	750	680	710	100	119,0	2902284500

Entry manholes 1000

Installation instructions

Installation instructions

The inspection chambers should be installed in conditions specified in the technical design. The ground around chambers (0,3 m) should be composed of compactable soil, approved for use in road construction according to standard PN-S-02205:1998. Earthworks should be carried out in accordance with standard PN-EN 1610:2002/Ap1:2007. Soil compaction should be performed in layers as specified in standard PN-ENV 1046:2007 to prevent from excessive ovalisation of a chamber cross-section.



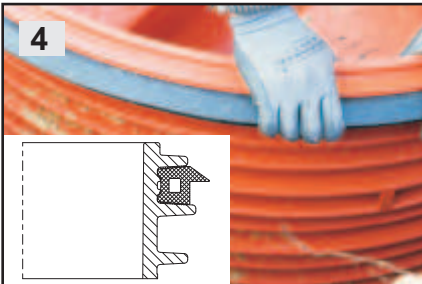
Prepare a trench in an inspection chamber location removing large and sharp-edged stones. On the trench bottom prepare bedding composed of compactable soil, preferably sand (coarse- medium- or fine-grained) of minimum 10 cm thickness. An inspection chamber zone should include an area of at least a 30 cm wide strip around the chamber.



Place a base unit on a prepared earlier sand bedding and level it and then connect sewage pipes to the chamber. A place where a manhole is located should be lowered by approximately 10 cm. Connect sewage pipes.



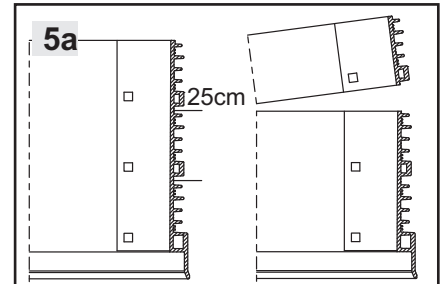
Fill up the trench with preliminary backfill (10 cm above the pipe level). Compaction should be performed manually, in layers every 15 cm or with light mechanical equipment (each layer up to 30 cm). Base unit 1000 should protrude above the backfill level.



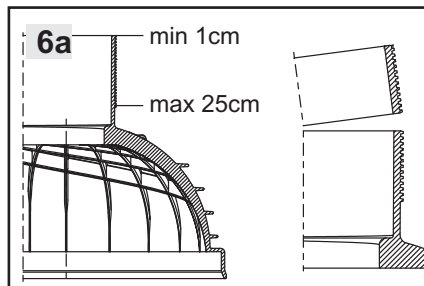
Install a gasket Ø1000 in the lowest groove on the outside of the ring. The groove should be thoroughly cleaned before gasket installation.



Lubricant should be applied onto a gasket Ø1000 before jointing with another manhole section. Products approved for rubber gaskets and plastic should be used. Note! If there are no rings of diversified heights on a building site, rings of standard heights may be cut. Rings may be cut only at marked places every 25 cm.



A taper should be installed similarly to other manhole components (rings Ø1000). A cylindrical section of the taper (from the minimum of 1 to the maximum of 25 cm) may be cut to achieve the required manhole height.



Note! A gasket may be installed in the cylindrical taper section (between the taper and a concrete ring).



For shallow installations, taper 1000/600 may be connected directly to a base unit with no ring used.

Entry manholes 1000

Installation instructions

Installation instructions



Compact the area around the pipe. Compaction should be performed manually, in layers every 15 cm or with light mechanical equipment (each layer up to 30 cm) in open areas to at least 90% of the Proctor compaction test and for inspection chambers located in a carriageway or road shoulder backfill should meet the requirements specified for compaction index resulting from the installation depth, road construction type (cutting, embankment) or traffic intensity category.

The manhole cover should be secured against shifting by means of anchoring or concreting.

Manhole tops

Location of a 1000 manhole and expected load caused by traffic are the basis for selection of riser and telescope pipe stiffness and a choice of cast iron covers.

Depending on the chamber location within a ROW and a traffic intensity category, different manhole/gully tops are used, also construction requirements and top type which are classified into the following groups may differ.

Group 1 - Class A15 - green areas intended solely for pedestrians and pedal cyclists

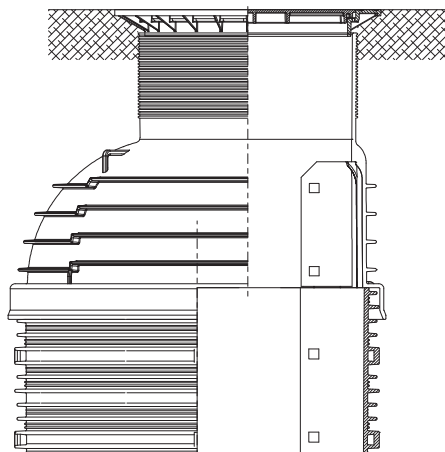
Group 2 - Class B125 - Roads and areas for pedestrians, and comparable areas, parking lots or places where cars are parked

Group 3 - Class C250 - Applies solely do sewer gully tops installed in the area of kerbside channels of roads and road shoulders

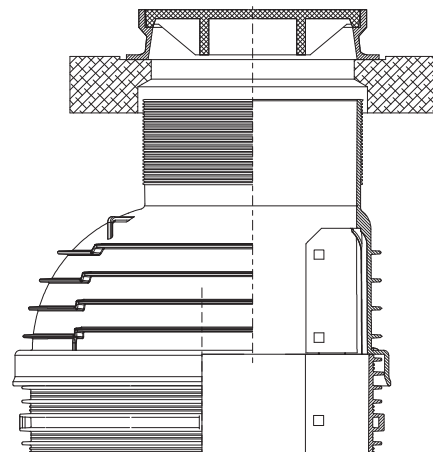
Group 4 - Class D400 - Carriageways of roads (including pedestrian streets) hard shoulders, and parking areas for all types of road vehicles

There are different rules of the manhole/gully top support depending on their type and class, and soil conditions. A manhole/gully top should sit on a reinforced concrete slab which is supported by an appropriately constructed load bearing structure adapted to loads caused by traffic. That may be reinforced bedding made of well compacted soil or a precast load-relieving slab made of reinforced concrete. For very heavy load caused by traffic or doubts about compaction of soil constituting the top base, a slab should be based on B30 concrete ring of minimum height of 20 cm cast on a building site

PP chamber cover DN 600



Cast iron cover DN 600



Entry manholes 1000

Solution options

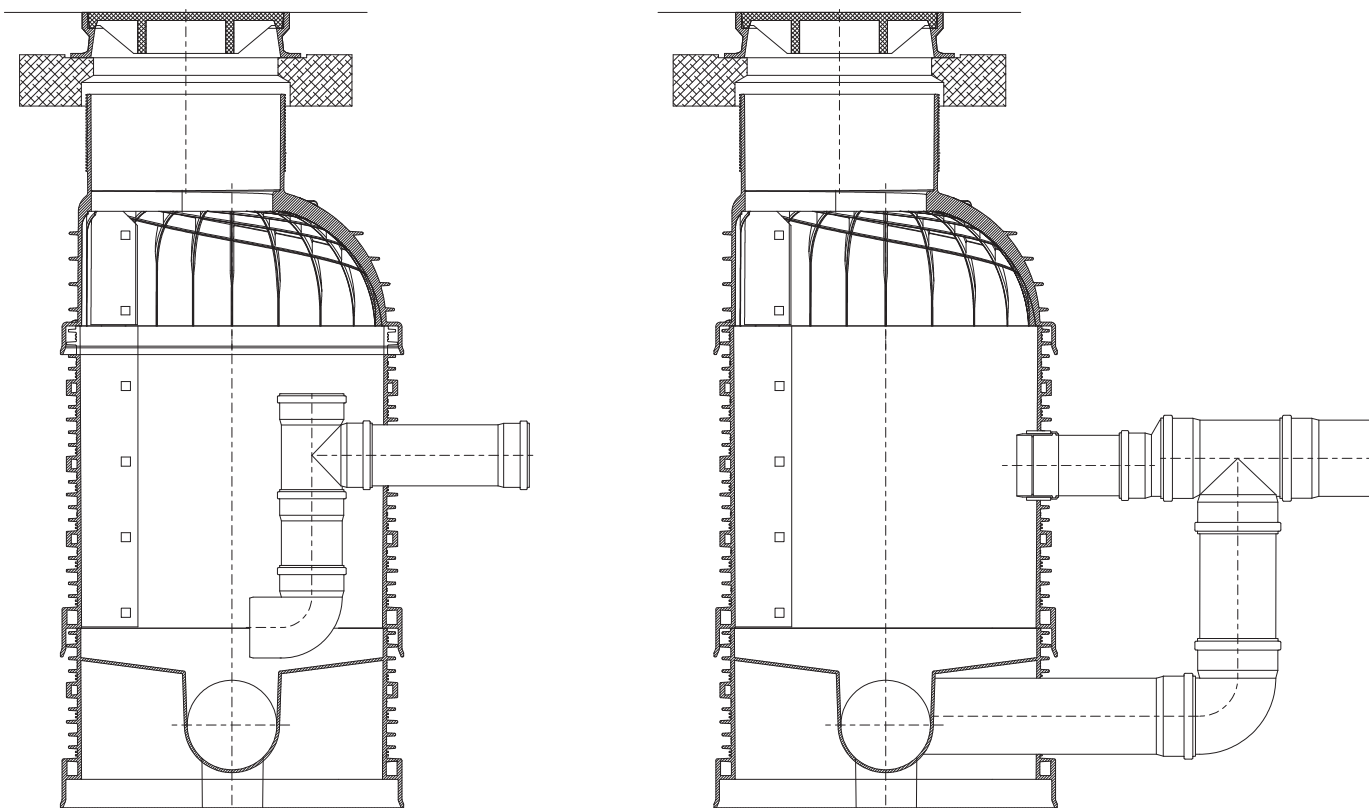
Backdrop manholes

Sometimes it is necessary to connect a channel to a manhole above a base unit.

Then, a so called backdrop manhole is constructed. According to standard PN-B-10729 "backdrop manholes in channels of diameters up to 0,40 m and drop height from 0,5 - 4,0 m may be constructed with a backdrop pipe placed inside or outside of a manhole. In a non-entry inspection chamber a drop pipe may be not installed.

That means that for non-entry inspection chambers, if a channel diameter does not exceed 160 mm, connection may be made through a hole in a riser pipe.

Appropriate in-situ gaskets are installed in the hole. If a channel is a K2-Kan structured pipe, a special fitting (adapter to a PVC socket) should be inserted into the in-situ gasket. A backdrop pipe is not used. However, if a channel diameter exceeds 200 mm, a backdrop pipe has to be used and it should be connected to a chamber base unit. A T-branch connection is fitted to the channel. One of T-connections is connected to the backdrop pipe and the second (after diameter reduction to 60 mm) is connected to a riser pipe (hole with an in-situ gasket).



Certificate

Standard **ISO 14001:2015**

Certificate Registr. No. **01 104 069520**

Certificate Holder:



Kaczmarek Malewo Spółka Jawna

Malewo 1
63-800 Gostyń
Poland

including the factories according to annex

Scope:

production and distribution of plastic products for building gas-, water-sewerage, sewage-, gutter-, cable protection, land melioration systems and tubular plates

Proof has been furnished by means of an audit that the requirements of ISO 14001:2015 are met.

Validity:

The certificate is valid from 2022-06-27 until 2025-06-26.
First certification 2007

2022-06-22

A handwritten signature in blue ink, likely of the auditor or representative of TÜV Rheinland.

TÜV Rheinland Cert GmbH
Am Grauen Stein · 51105 Köln

CERTIFICATE OF CONFORMITY**23 – HYPBCПCPБ – VR – 036 – 49**

Issued pursuant to Art. 14, par.1 and/or par.2 of Ordinance № RD-02-20-1 from 05.02.2015 on the terms and the conditions for the use of construction products in the construction works of the Republic of Bulgaria of the Ministry of Regional Development and Public Works for the construction product

Pipes from polypropylene (PP)
trademark „KompactKIT”

STRUCTURED-WALL PIPES WITH SMOOTH INTERNAL AND EXTERNAL SURFACE
System type “A1”

Designed for non-pressure underground drainage and sewerage used outside building structure.
Produced from PP, with range, dimensions, ring stiffness and evaluated characteristics in accordance with Annex № 1 to this Certificate

Released on the market by:
Valrom Industrie S.R.L.
28 Preciziei str, sector 6, Bucharest, Romania

Produced in:
Valrom Industrie S.R.L.
28 Preciziei str, sector 6, Bucharest, Romania

This Certificate certifies that the product has been evaluated and conforms to the national requirements, defined in

BDS EN 13476-2:2018+A1:2020
BDS EN 13476-2:2018+A1:2020/ NA:2021

and point 11 from Annex № 2 to item 2 of Order № ПД-02-14-1329 from 03.12.2015 of the Minister of the Regional Development and Public Works

The Certificate was issued for the first time on **23.06.2023** and remains valid until **22.06.2026**, provided that the producer ensures consistency of product characteristics and the conditions of production or production control have not been changed significantly.

Place of issuance: Sofia
Date: 23.06.2023

BULAQUA } STANDART
CEO:
(Dipl. Ing. Alexander Marinchev)

This certificate includes 1 Annex of 1 page, which is an integral part of the same.

Annex №1

to Certificate of conformity № 23 – НУРВСПСРБ –VR – 036 – 49

issued on 23.06.2023 and valid until 22.06.2026

1. Dimensions and working pressure

Nominal sizes DN/OD	Ring stiffness SN, kN/m ²	Type of pipes and material
160	8 10	Multilayer pipes from high-modulus polypropylene (PP-HM)
200		
250		
315		
400		

2. Evaluated characteristics in accordance with the national requirements

Characteristic	Declaration requirement
Appearance and colour	According to BDS EN 13476-1:2018, item 6
Geometrical characteristics, mm: - average external diameter, DN/OD - average internal diameter, DN/ID	Tables 5, 6 and 7 According to BDS EN 13476-2:2018+A1:2020
Impact resistance at 0 °C (round the clock method)	TIR ≤ 10 % % of damaged samples According to BDS EN 13476-2:2018+A1:2020
Ring stiffness SN, kN/m ²	≥ from the declared value of SN According to BDS EN 13476-2:2018+A1:2020
Ring flexibility, kN	item 9.1.2. According to BDS EN 13476-2:2018+A1:2020
Longitudinal reversion, %	≤ 2% no damage, declamations, cracks or bubbles on the pipe According to BDS EN 13476-2:2018+A1:2020

Place of issuance: Sofia
Date: 23.06.2023BULAQUA STANDART
CEO:
(Dipl. Ing. Alexander Marinchev)

CERTIFICAT DE CONFORMITATE



Nr. de înregistrare **OC ICC 11 A0007462-22**



Data emiterii

10 august 2022

Valabil până 10 august 2025

ORGANISMUL DE CERTIFICARE OCpr. - 003

ORGANISMUL DE CERTIFICARE produse din cadrul SC "Inspecție-Certificare-Calitate" S.R.L.
MD 2032, mun. Chișinău, str. Sarmizegetusa, 92, tel./fax 022 50-70-75, www.certificare.md
Certificat de acreditare nr. OCpr - 003 valabil până la 28.11.2022.

PRIN PREZENTUL DOCUMENT SE CONFIRMĂ FAPTUL, CĂ PRODUSELE IDENTIFICATE ASTFEL:
DENUMIREA / DESCRIEREA

Codul NCM
3917

Țevi din polipropilenă din PP multistrat, DN 110 mm ÷ 500 mm, SN 2 ÷ SN 16
cu și fără mufă, pentru instalații de canalizare fără presiune subterane. Marca KompactKIT.
Fabricare în serie conform EN 13476-2.

SÎNT CONFORME CU CERINȚELE OBLIGATORII STABILITE ÎN:
SM EN 13476-2+A1:2020 p. 4.3.2 (tab.2), 6, 7.2.1, 7.2.3 (tab.5), 7.2.5.2 (tab.6), 8.2.1 (tab.10), 11.1,
11.2.1 (tab.18)

PRODUCĂTOR

S. C. „VALROM INDUSTRIE” SRL, bd. Preciziei, nr. 28, sector 6, București, România

Codul țării
RO

SOLICITANT

S. C. „VALROM INDUSTRIE” SRL, bd. Preciziei, nr. 28, sector 6, București,
România

Codul IDNO
RO8529679

CERTIFICATUL ESTE ELIBERAT ÎN BAZA

Raportului de încercări nr. 233-T din 02.08.2022, eliberat de către LÎ din cadrul ÎM „Palplast” SRL, str. Alexandru cel Bun 114, or. Călărași, RM certificat de acreditare nr. LÎ-031 valabil până la 20.06.2023, Raportului de identificare a produselor nr. 9174-22 din 17.05.2022, Raportului de control tehnic al produselor supuse certificării nr. 9174-22 din 17.05.2022; Raportului de evaluare a procesului de producție Nr. 9174-22 din 18.05.2022, Raportului sumar Nr. 9174-22 din 10.08.2022, eliberate de OC "ICC".

INFORMAȚIE SUPPLEMENTARĂ:

Schema de certificare nr. 3. Evaluarea periodică se va efectua o dată pe an de OC "ICC" conform contractului de evaluare periodică a produselor certificate Nr. 22.22.9174-EPPC din 10.08.2022. Certificatul este valabil doar în cazul asigurării fiecărei unități de produs certificat cu informația amplă în limba de stat în conformitate cu legislația în vigoare. La întreprindere este implementat sistemul de management al calității ISO 9001:2015, certificatul nr.8172 valabil până la 19.11.2022, sistemul de management al sănătății și securității ocupaționale SR ISO 45001:2018, certificatul nr.3298, valabil până la 26.11.2022, sistemul de management de mediu SR EN ISO 14001:2015, certificatul nr.3505, valabil până la 26.11.2022 eliberate de SRAC CERT SRL atestat de acreditare SM 004, București, România.

ADJ. CONDUCĂTORUL
ORGANISMULUI DE CERTIFICARE

Neaga O.



Seria A Nr. 0007462

În atenția antreprenorilor și organelor de control !

Copiile certificatelor se legalizează prin specimenul de stampilă și semnătura deținătorului certificatului

FISA TEHNICA

TEVI <KompactKIT> PP HM MULTISTRAT COMPACT D.160÷400mm SN10 si SN8

1. Domeniu de utilizare

- Tevile multistrat din polipropilena PP HM se utilizeaza in retelele exterioare de canalizare fara presiune (canalizare gravitationala in care curgerea este cu nivel liber) pentru transportul apelor uzate menajere si meteorice, temperatura maxima a fluidului transportat 60°C. Tevile se monteaza ingropat in sol.

2. Caracteristici tehnice

- Standard de referinta: SR EN 13476-2 „Sisteme de conducte de materiale plastice pentru evacuare si canalizare, fara presiune, subterane. Sisteme de conducte cu pereti structurati de policlorura de vinil neplastifiata (PVC-U), polipropilena (PP) si polietilena (PE). Partea 2: Specificatii pentru tevi si fittinguri cu suprafata interioara si exterioara neteda si pentru sistem, tip A”.
- Tevile sunt fabricate prin co-extrudare.
- Structura teyii este alcatuita din:
 - un strat exterior si un strat interior din polipropilena tip PP HM (Polypropilene High Modulus),
 - stratul intermediar este din polipropilena PP B (Polypropylene block copolymers) cu adaos de sarja minerala.
- Tevile sunt fabricate din material virgin.

Caracteristici polipropilena bloc copolimer HM	Valoare *)	Metoda de testare
Densitate	900 kg/m ³	ISO 1183
MFR (230 °C/2,16 kg)	0,3 g/10min	ISO 1133
Modul de elasticitate la incovoiere (2 mm/min)	1.500 - 2.000 MPa	ISO 178
Rezistenta la limita de curgere (50 mm/min)	35-38 MPa	ISO 527
Rezistenta la impact Charpy, crestet (23 °C)	29 kJ/m ²	ISO 179/1eA
Rezistenta la impact Charpy, crestet (-20 °C)	2 kJ/m ²	ISO 179/1eA

*) Valorile din tabel trebuie considerate ca fiind caracteristice fara sa fie insa limitative.

- Constructia teyii multistrat si alegerea materialelor garanteaza rezistenta tevilor la: solicitari mecanice, impact, abraziune, actiunea substantelor chimice si conditiile atmosferice.
- Rugozitatea scazuta de la interiorul tevilor creaza conditii optime de exploatare a retelei, prin reducerea pierderilor de sarcina si a depunerilor de sedimente.
- Culoare: straturile de la exterior si interior au culoarea brun-portocaliu (RAL8023) si stratul intermediar este de culoare neagra.
- Tevile au ambele capete sanfrenate. Fiecare teava se livreaza impreuna cu cate o mufa cu opritor.
- Mufele sunt fabricate prin injectie din PP copolimer High Modulus (PPHM), clasificate

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S13,3 conform standardului EN 1852-1:2018, respectiv SN8.

- Mufele duble sunt cu garnituri capabile sa asigure etanșeitatea si in conditii extreme (2,5 bari), avand compatibilitate constructiva si functionala cu teville (coduri: 35100080160; 35100080200; 35100080250 si 35100080315).
- Teville au clasa de rigiditate SN10 ($\geq 10 \text{ kN/m}^2$), respectiv SN8 ($\geq 8 \text{ kN/m}^2$) determinata conf. ISO 9969.
- Contractie longitudinala la cald, determinata conf. EN ISO 2505: max. 2%.
- Etanșeitatea imbinarilor este verificata $\geq 0,5 \text{ bar}$ conf. EN 1053.
- Aspect: atunci cand sunt examinate cu ochiul liber (fara instrumente de marire), suprafetele trebuie sa fie netede, curate si fara bavuri, pori si alte defecte de suprafata care pot afecta performantele tevilor. Capetele care se racordeaza trebuie sa fie taiate curat si perpendicular pe axa tevii.
- Dimensiuni:

SN10

Diametru nominal DN [mm]	Diametru exterior Dext. [mm]	e _n min. [mm]	l [m]	Cod articol
160	160 – 160,5	6,2	6	35059160600
200	200 – 200,5	7,7	6	35059200600
250	250 – 250,5	9,6	6	35059250600
315	315 – 315,6	12,1	6	35059315600
400	400 – 400,7	15,3	6	35059400600

SN8

Diametru nominal DN [mm]	Diametru exterior Dext. [mm]	e _n minim [mm]	l [m]	Cod articol
160	160 – 160,5	5,5	6	35058160600
200	200 – 200,5	6,9	6	35058200600
250	250 – 250,5	8,6	6	35058250600
315	315 – 315,6	10,4	6	35058315600
400	400 – 400,7	13,7	6	35058400600

e_n minim = grosimea minima a tevii

l= lungimea tevii.

Marcaj:

- **Numele producatorului:** Valrom
- **brand:** KompactKIT
- **MADE IN ROMANIA**
- **diametru exterior nominal:** Ø (mm)
- **cod arie aplicare:** U
- **clasa de rigiditate:** SN10 sau SN8
- **standard:** EN 13476 – 2
- **material:** PP HM
- **informatii pentru trasabilitate:** LOT xxyy (xx - ultimile doua cifre ale anului, yy - numarul de ordine al lotului); data ziua si luna (xx, yy); ora si minut

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3. Ambalare, manipulare , transport si depozitare

- Pentru transportul tevilor se vor utiliza vehicule potrivite cu suprafata plana, fara asperitati, care nu vor deteriora tuburile. Tevile trebuie sustinute pe toata lungimea lor, pentru a evita deteriorarea la extremitati din cauza vibratiilor.
- La incarcarea sau descarcarea tevilor cu stivuitoare cu furci lise se va acorda atentie ca furcile sa nu loveasca tuburile in timpul manevrarii. La manevrarea tevilor este bine sa se foloseasca curele din materiale neabrazive (nylon, canepa sau similar). Daca se folosesc cabluri de otel este necesar sa se protejeze tevile in zona de contact. In perioadele friguroase, la temperaturi de inghet, tevile sunt predispuse la deteriorari in cazul impactului. Se recomanda manipularea tevilor cu maxima atentie.
- Se recomanda sa fie incarcate la inceput tevile mai grele pentru a evita deformarea celor mai usoare.
- Pe termen lung (> 90 zile) depozitarea se face in spatii acoperite, incat produsele sa fie ferite de radiatia solara directa. Pe termen scurt <90 zile depozitarea se poate face in aer liber.
- In timpul manipularii, transportului si depozitarii se vor evita solicitarile lovirea si trintirea tevii, in special la temperaturi <5°C cind exista riscul de spargere.
- Tevile se vor depozita pe suprafate plane, stabile, in zone acoperite si protejate impotriva pericolului de incendiu, inghetului si de variatiile termice majore.
- Depozitarea provizorie pe santier trebuie facuta astfel incat tevile sa nu fie deteriorate, se va acorda o atentie deosebita pastrarii intacte a sectiunii capetelor tevilor pentru a nu compromite imbinarea.
- Se recomanda ca pe timp rece sa se depoziteze toate tuburile pe suporti pentru a se evita lipirea lor de sol la inghet.
- Tevile si garniturile se vor fi feri de contactul cu combustibili, solventi, uleiuri, grasimi, vopsele sau surse de caldura.
- Inaltimea stivei de depozitare nu va depasi 1 m (indiferent de diametrul tevii) astfel incat sa se evite deformarea tevilor de la baza.
- Daca tevile au fost livrate in pachet atunci desfacerea pachetului se va face doar cu putin timp inainte de inceperea operatiilor de montare in sant.

4. Garantie si durata de viata

- Durata de utilizare este de 50 de ani.
- Garantia este de 5 ani de la data livrarii cu conditia respectarii instructiunilor de transport, depozitare, manipulare si instalare.
- Tevile au Aviz si Acord tehnic pentru utilizare in constructii Romania si Certificat conformitate pentru Rep. Moldova
- Tevile nu includ componente din categoria pieselor de schimb.

5. Punere in opera

- Materialul polipropilena nu se poate imbina cu adeziv, pentru realizarea racordurilor laterale se folosesc seile si racordurile mecanice de bransare <KompactKIT>.
- Etape la imbinare

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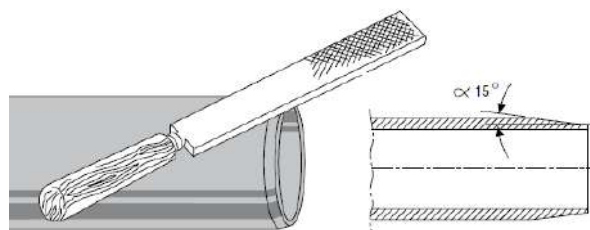
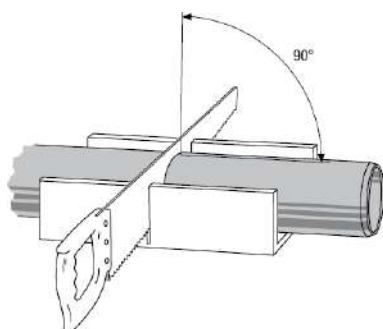
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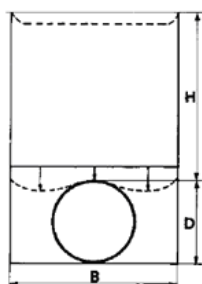
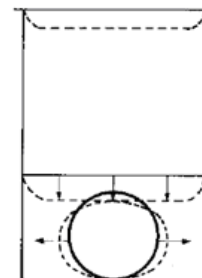
- înainte de realizarea imbinării se vor curăța cu atenție partile care se unesc, se vor verifica să fie intacte;
- se va scoate provizoriu garnitura de etansare;
- se va introduce capatul tevi în mufa până la capăt și se va marca poziția, se retrage teava cca. 3 mm pentru fiecare metru de teava de la ultima imbinare, dar nu mai mult de 10mm, și se va marca linia de referință;
- se introduce corect garnitura de etansare în mufa;
- se va lubrifia suprafața internă a garniturii și suprafața externă a capatului tevi cu ajutorul unui lubrifiant special (ulei siliconat, apă cu săpun, etc). Nu se va folosi ca lubrifiant uleiul sau grăsimea.
- se împinge capatul tevi în mufa până la linia de referință fiind atenți ca garnitura să nu iasă din locul ei. Reușita acestei operațiuni depinde de alinierea exactă a tevilor și de lubrifiere;

Taiera tevilor se realizează cu un ferastrău cu dinți fini sau cu o freza.

Taiera se face la unghi de 90° , capetele tevilor se debavurează după care se realizează un nou sanfren la unghi de 15° .



- Tevile multistrat din PP se încadrează în categoria tevilor flexibile. Caracteristica tevilor flexibile este aceea că sub sarcini ele se deformează semnificativ fără să se deterioreze. Pentru limitarea deformării tevi este foarte important ca umplutura laterală să se compacteze cât mai corect. Gradul de compactare necesar este stabilit prin proiect.
- Alegerea corectă a materialului de umplutură și execuția corectă a pozării sunt factori care pot limita deformarea tevi.

deformarea în sant a unei tevi rigide

deformarea în sant a unei tevi flexibile


Instalarea tevilor se realizează conform prevederilor din proiect.

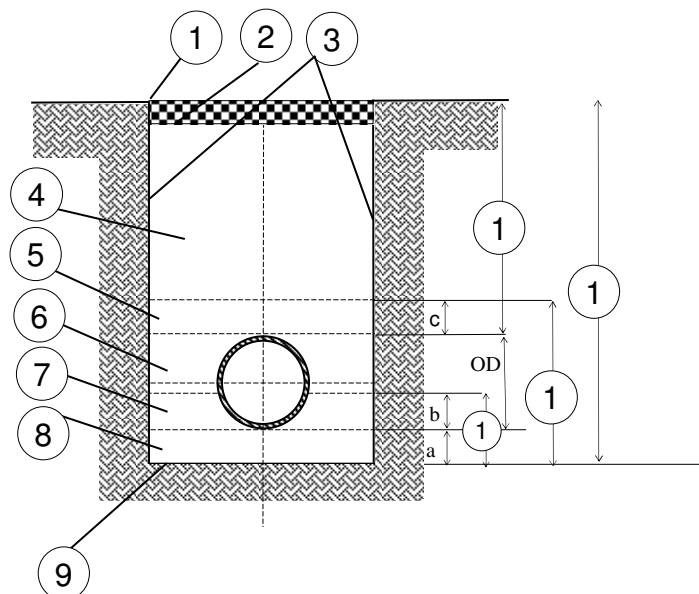
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- | | | | |
|---|-------------------------------|----|-------------------------------|
| 1 | Suprafata | 10 | Inaltime de acoperire |
| 2 | Baza infrastructurii drumului | 11 | Inaltimea reazemului |
| 3 | Peretii transeei | 12 | Inaltimea umpluturii speciale |
| 4 | Umplutura propriu -zisa | 13 | Adancimea transeei |
| 5 | Prima umplutura | a | Grosimea patului inferior |
| 6 | Umplutura laterala | b | Grosimea patului superior |
| 7 | Patul superior, b | c | Grosimea primei umpluturi |
| 8 | Patul inferior, a | OD | Diametrul exterior al tevii |
| 9 | Fund de transee | | |

Conditii generale de pozare:

Tevile multistrat din PP se monteaza in general la adancimi de minim 1,20 m. In situatia in care se pozeaza in zone fara trafic adancimea minima se poate reduce la adancimea minima de inghet.

Latimea santului

Latimea santului se stabileste prin proiect, trebuie sa asigure spatiul necesar pentru executia imbinarilor in sant si pentru compactarea umpluturii din zona tevii.

Latimea santului nu trebuie sa depaseasca valoarea maxima stabilita prin proiect.

Clasificarea santurilor:

Tipul santului	B	
Sant ingust	$\leq 3 D$	$< H/2$
Sant larg	$> 3 D$	$< H/2$
Sant infinit	$\geq 10 D$	$\geq H/2$

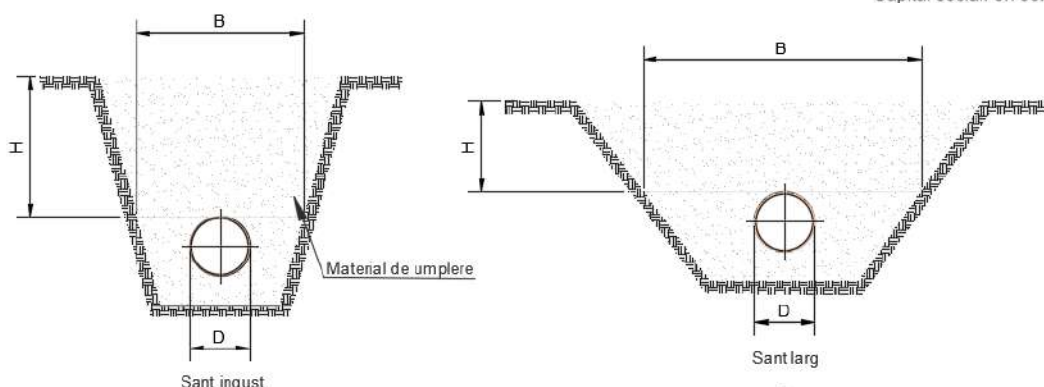
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Fundul santului

Fundul santului trebuie sa fie uscat (fara ape subterane sau meteorice), continuu, uniform si fara pietre.

Materialul si panta fundului santului trebuie sa fie in conformitate cu specificatiile din proiect. Se recomanda sa nu se modifice fundul santului, daca el a fost modificat trebuie obligatoriu restabilita capacitatea portanta initiala.

In cazul in care fundul santului este instabil sau solul este compresibil trebuie prevazute masuri corespunzatoare.

In cazul terenurilor cu continut ridicat de substante organice, instabile (turba sau nisip curgator) etc, este necesara proiectarea unui strat suport sub patul de asezare. Natura si compozitia stratului suport se stabilesc de catre proiectant.

In caz de inghet este necesara protejarea fundului santului astfel incat straturile inghetate sa nu fie lasate sub sau in jurul tevii.

Reazemul

Rezemul se compune din patul inferior si patul superior. In cazul in care teava este asezata pe fundul natural al santului, atunci acesta constituie patul inferior.

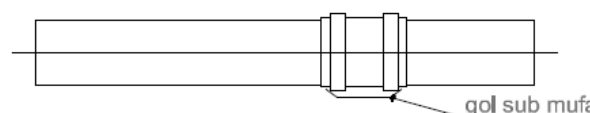
Rolul reazemului este de a asigura suport continuu pe intreaga lungime a tevii. Materialele utilizate pentru reazem trebuie sa indeplineasca anumite cerinte astfel incat sa fie capabile sa asigure stabilitate permanenta si capacitate portanta tevilor ingropate in sol.

Materialele pentru reazem nu trebuie sa contina particule cu dimensiuni mai mari de 20mm pentru teville cu $D \leq 200\text{mm}$ si maxim 40mm pentru teville cu diametrul intre 200 si 630mm.

Pamantul excavat poate fi utilizat daca acesta intruneste anumite cerinte: este acceptat de proiect, intruneste cerintele de compactare prevazute in proiect, nu contine materiale care pot deteriora teville (ex: elemente cu dimensiuni excesive, radacini de copaci, deseuri, materiale organice, zapada si gheata) sau bulgari de argila mai mari de 75mm.

Grosimea patului inferior este de 10-15cm. Materialul patului inferior se imprastie pe intreaga latime a fundului santului si se niveleaza la panta tevii.

In dreptul mufelor de imbinare se vor sapa mici goluri, in acest fel teava se va sprijini pe intreaga ei lungime, pe masura avansarii montajului golurile se



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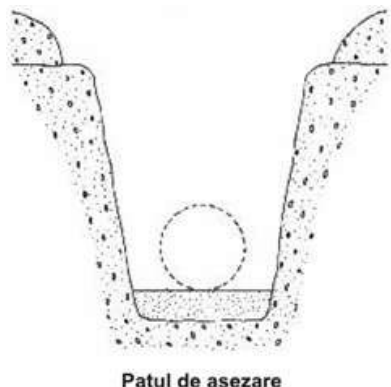
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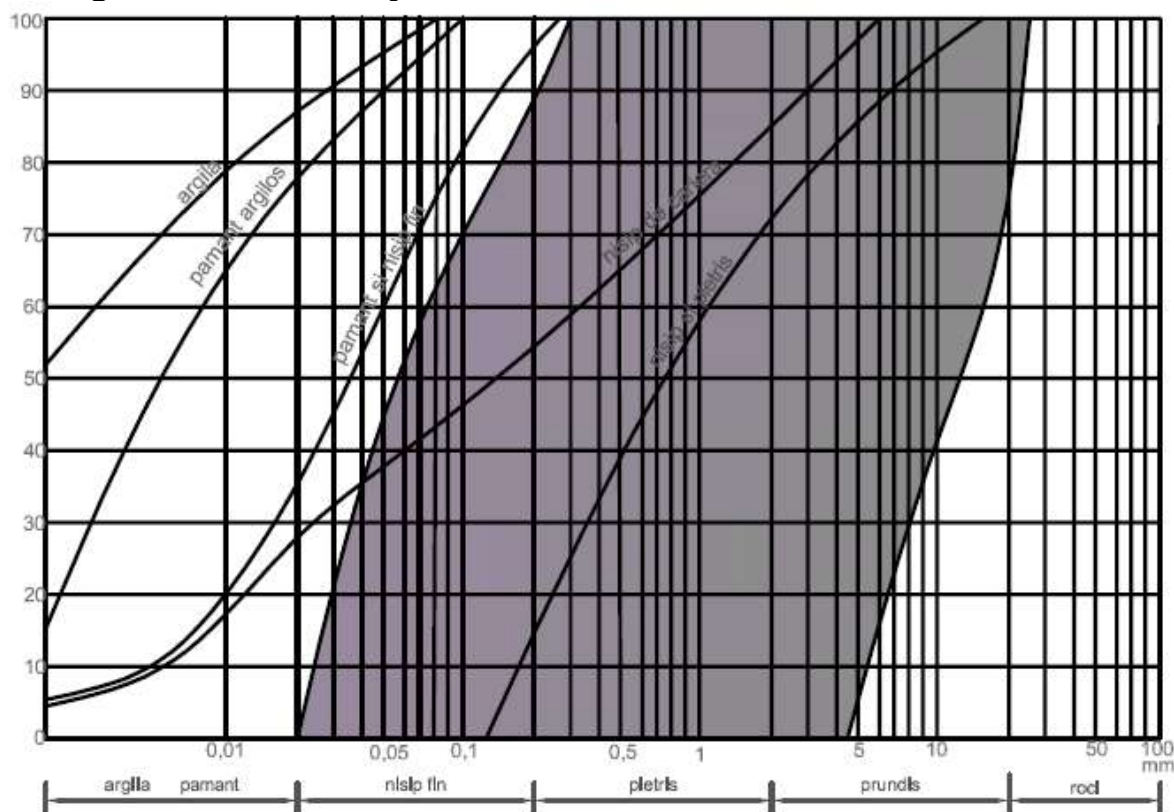
vor umple și se vor compacta cu atenție.



Patul de asezare

Materialul potrivit pentru reazem și pentru umplutura laterală este indicat în grafic și delimitat de zona hasurată. În practică, materialul cel mai potrivit este compus din pietris cu dimensiunea de 10-15mm sau de nisip amestecat cu pietris cu dimensiunea maximă de 20mm.

Curbe granulometrice. Grupe de soluri



Orizontala: Diametrele granulelor care corespund dimensiunilor interioare ale ochiurilor sitelor (mm)

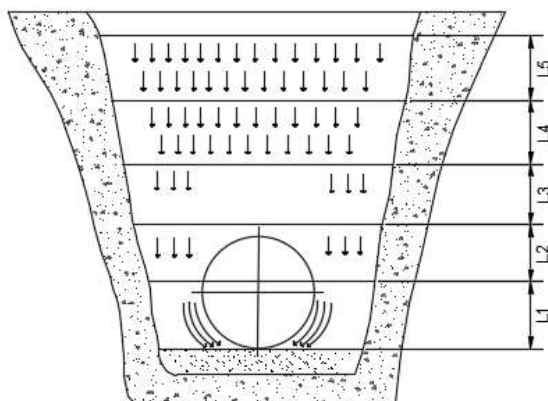
Verticală: Greutățile cumulate ale fracțiunilor care au trecut prin site, calculate în procente din greutatea totală (%)

Executarea umpluturilor

Umplutura manuală din zona tevii este cea mai importantă deoarece de modul în care se execută depinde formarea patului de rezemare al tevii și comportarea în exploatare la solicitări mecanice exterioare.

Executarea umpluturii din jurul tevii și a umpluturii propriu-zise nu trebuie întreprinsă decât atunci când starea reazemului și a îmbinării tevilor permit să reziste încărcărilor.

Materialul deja folosit pentru construirea patului va fi așezat în jurul tevii și compactat manual (bine batut cu maiul și umezit la limita pentru indesare maximă) în straturi subțiri



(10 cm) până la linia mediană a tubului având mare grijă să nu rămână zone goale sub tub și ca părțile laterale dintre tub și peretii săpăturii să fie continue și compacte (stratul L1).

Cel de-al doilea strat al părții laterale L2, va ajunge până la generatoarea superioară a tubului. Umplerea și compactarea trebuie realizate simultan pe ambele laturi ale tubului pentru a preveni o deplasare nedorită a lui. Stratul al treilea L3, va atinge o cota mai mare cu 15 cm decât cota generatoarei superioare a tubului. În stratul L3 compactarea va trebui să

fie aplicată tubului doar lateral și nu deasupra lui. Umplerea ulterioară (straturile L4 și L5) se va efectua cu ajutorul pamantului care provine din săpătura curățat de elemente cu dimensiunea mai mare de 100mm, de rădăcini, deseuri, materiale organice, zapada, gheață sau bulgari de argilă mai mari de 75mm. În zone în care nu este necesară compactarea se acceptă elemente cu dimensiunea maximă de până la 300mm dacă creasta țevii a fost acoperită cu strat de umplutură de minim 300mm.

Indicele Proctor rezultat trebuie să fie mai mare decât nivelul prevăzut de proiectant.

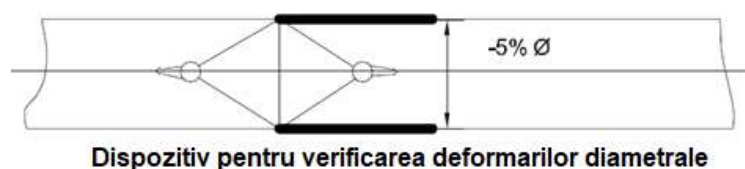
Tehnologia de compactare se realizează în concordanță cu calculele de verificare a rezistenței tubului la încărcări din pamant și alte solicitări. Ultimul strat care se așază este stratul vegetal.

Verificarea deformării diametrale

Trebuie inspectată variația pe verticală a diametrului interior al tevilor, pentru verificarea conformității cu calculul de rezistență mecanică.

În general deformarea maximă a conductei nu trebuie să depășească 5-6%. Această valoare limită este impusă din considerente de exploatare a rețelei.

Verificarea poate fi efectuată cu ajutorul instrumentelor mecanice (sfera sau con dublu) sau cu ajutorul instrumentelor optice (telecamere). Din procedura de recepție sunt excluse, din cauza dificultăților de realizare, părțile de conductă care includ piese speciale.



Dispozitiv pentru verificarea deformărilor diametrale

În cazurile în care se prezintă valori de deformare mai mari decât cele stabilite mai sus se impune examinarea cauzei.

Proba de etanșeitate

Se efectuează conform prescripțiilor din proiect și prevederilor naționale în vigoare:

NP 133 Normativ privind proiectarea, execuția și exploatarea sistemelor de alimentare cu apă și canalizare a localităților.

Valrom Industrie SRL

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REG COM J40/4810/1996
CIF RO8529679
Capital social: 6.706.000 lei

STAS 3051-91: Sisteme de canalizare. Canale ale rețelilor exterioare de canalizare. Prescripții fundamentale de proiectare

Probarea conductelor din rețele de canalizare, conform NP 133:

Inercarea de etanșeitate a rețelilor de canalizare se efectuează conform prevederilor din STAS 3051. Inercarea de etanșeitate se execută pe tronsoane, de maxim 500 m.

Înainte se efectuează:

- umpluturile parțiale lăsându-se îmbinările libere
- închideri etanșe pentru toate orificiile
- blocarea extremităților și a punctelor susceptibile de deplasare în timpul probei.

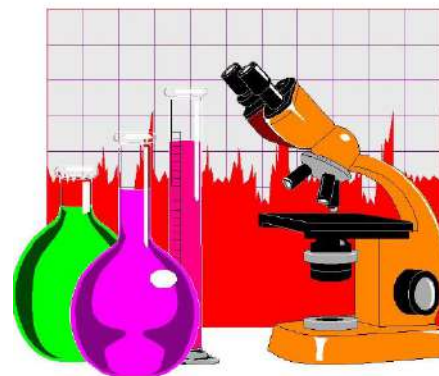
OBSERVAȚII:

- Dacă se dorește utilizarea tevelor multistrat din PP cu ape uzate contaminate chimic (ex. ape industriale) la proiectare trebuie să fie evaluată rezistența chimică a tevelor (v. Anexa: Rezistența chimică a polipropilenei) și luarea în considerare a temperaturii de utilizare.
- Pentru evaluarea comportării garniturii de etansare trebuie consultat documentul ISO/TR7620 *Rezistența chimică pentru materiale din cauciuc*.

ANEXA: REZISTENȚA CHIMICĂ A POLIPROPILENEI

Rezistența chimică a polipropilenei așa cum este specificat în documentul *ISO/TR 10358:1993 Plastics pipes and fittings - Combined chemical-resistance classification table*.

Informațiile reprezintă un sumar al datelor privind rezistența chimică a polipropilenei PP, prezentate în diferite surse publice, derivate atât din experiența practică cât și din încercări de laborator.



Evaluarea s-a făcut prin imersarea unei mostre de material în respectivul fluid la 20°, 60° și 100°C, la presiune atmosferică - în absența presiunii interioare și a altor solicitări mecanice externe - urmata de determinarea caracteristicilor de tracțiune.

Note:

- În tabele concentrațiile soluțiilor sunt exprimate masic.
- Informațiile furnizate în cadrul acestui buletin tehnic se referă doar la rezistența chimică. Deoarece în general sunt implicați și alți factori, cum ar fi permeabilitatea, geometria produsului, etc. se recomandă testarea compatibilității materialului pentru fiecare utilizare în particular.

Definiții, simboluri și clasificări:

Valrom Industrie SRL

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- **rezistența chimică:** abilitatea unui material (plastic) de a rezista (modifică la un nivel minim caracteristicile inițiale) după expunerea într-un fluid sau contact direct cu o anumită substanță (cum ar fi acizi, baze, uleiuri, grăsimi, etc.); rezistența chimică este apreciată prin determinarea unor caracteristici mecanice determinante pentru condițiile de utilizare: pierdere de masă, grad de umflare, caracteristici efort-deformare la tracțiune etc.
- **rezistent: +**
materialul nu este afectat sau efectul este minor și greu de cuantificat; stabilă pe termen lung.
- **rezistență limitată: o**
mediul poate umfla PP sau poate induce modificări chimice limitate. Utilizarea este restricționată în termeni de presiune și temperatură și trebuie luată în considerare scurtarea duratei de viață în exploatare.
- **nerecomandat: -**
efectul produs este sever și utilizarea PP-ului în contact cu acest fluid **NU** este recomandată
- **Sat.:** soluție apoasă saturată, obținută la 20°C
- **Sol:** soluție apoasă la o concentrație $\geq 10\%$ dar nesaturată
- **Sol. dil:** soluție diluată la o concentrație $\leq 10\%$
- **Sol. ind.:** soluție apoasă la concentrație uzuală pentru utilizare industrială

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VALROM Industrie
BULETIN TEHNIC TCO03 – Rezistența chimică a polipropilenei
4. Rezistența chimică

Denumire	Condiții	Temperatură, °C		
		20	60	100
A				
Acid azotic	60%	+	-	
Acetat de butil	100%	+	o	o
Acetat de etil	100%	o	o	
Acetat de metil	100%	+	+	
Acetat de pentil	100%	o		
Acetat de plumb	Sat.	+	+	
Acetofenona	100%	o	o	
Acetona	100%	+	+	
Acid acetic	max. 40%	+	+	
Acid acetic	50%	+	+	
Acid acetic	10%	+	+	
Acid acetic	97%	+	o	
Acid azotic	fumans	-	-	
Acid azotic	70%	-	-	
Acid benzoic		+	+	
Acid boric		+	+	
Acid carbonic		+	+	
Acid citric	10%	+	+	
Acid cloracetic	Sat.	+		
Acid clorsulfonic	100%	-	-	-
Acid formic	100%	+		
Acid fosforic	95%	+	+	
Acid hidroxi-acetic	30%	+		
Acid lactic	max. 90%	+	+	
Acid oleic	100%	+	o	
Acid oxalic				
Acid sulfuric	max. 10%	+	+	+
Acid sulfuric	50%	+	o	o
Acid sulfuric	96%	+	o	-
Acid tanic	10%	+	+	
Acid tartric		+	+	
Acid tricloraetic	10%	+	+	
Acizi grasi (C6)	100%	+	+	
Alcool benzoic	Sat.	+	+	
Alcool etilic	max. 95%	+	+	+
Alcool izopropilic	100%	+	+	+
Alcool metilic	5%	+	o	o
Amoniac (sol apoasa)	max. 30%	+		
Anilina	100%	+	+	
Apa de mare		+	+	+
Apa distilata	100%	+	+	+
Apa regala		o	o	
Azotat de calciu		+	+	
Azotat de cupru	Sat.	+	+	
Azotat de fier	Sat.	+	+	
Azotat de magneziu	Sat.	+	+	
B				
Benzen	100%	o	-	-
Benzina		-	-	-
Borax	Sol.	+	+	
Butanol	100%	+	o	o
Butil glicol	100%	+		
C				
Carbonat de bariu	Sat.	+	+	
Carbonat de calciu	Sat.	+	+	+
Carbonat de magneziu	Sat.	+	+	
Carbonat de sodiu	max. 50%	+	+	o
Cerneala		+	+	
Cetone		+		
Cianura de cupru	Sat.	+	+	
Ciclohexan	100%	+		
Ciclohexanol	100%	+	o	
Ciclohexanona	100%	o	-	-

Denumire	Condiții	Temperatură, °C		
		20	60	100
Clor (lichid)	100%	-	-	-
Clor (sol apoasa)	Sat.	+	o	
Clorbenzen	100%	-	-	
Cloretanol	100%	+		
Cloroform	100%	o	-	-
Clorura de aluminiu		+	+	
Clorura de amoniu	Sat.	+		
Clorura de bariu	Sat.	+	+	
Clorura de calciu	Sat.	+	+	+
Clorura de cupru	Sat.	+	+	
Clorura de etil	100%	-	-	
Clorura de fier	Sat.	+	+	
Clorura de magneziu	Sat.	+	+	
Clorura de nichel	Sat.	+	+	
Clorura de sodiu	20%	+	o	-
Combustibil aviatie (115/145 octan)		o	-	
Crezol	peste 90%	+		
D				
Decalina (decahidronaftalena)	100%	-	-	-
Detergenti	2%	+	+	+
Dibutilftalat	100%	+	o	-
Dicloretilena	100%	+		
di-etanol amina	100%	+		
di-etilen glicol	100%	+	+	
Diizooctil-ftalat	100%	+	+	
di-metil amina	100%	+		
di-metil formamida	100%	+	+	
Dioxan	100%	o	o	
Dioxid de sulf (umed sau uscat)	100%	+	+	
Disulfura de carbon	100%	o	-	
E				
Emulsifianti		+	+	
Emulsii acrilice		+	+	
Etanolamina	100%	+	+	
Eter izopropilic	100%	+	+	+
Etilenglicol	100%	+	+	+
F				
Fenol	5%	+	+	
Fenol	90%	+		
Formaldehida	40%	+		
Fosfat de calciu	50%	+		
Furfurol	100%	-	-	
G				
Glicerina	100%	+	+	+
Glicol		+	+	
H				
Heptan	100%	o	-	-
Hexan	100%	+	o	
Hidrogen	100%	+		
Hidroxid de bariu		+	+	
Hidroxid de calciu		+	+	
I				
Izo-octan	100%	-	-	
L				
Lanolina	100%	+	+	
Lapte		+	+	+
M				
Mercur	100%	+	+	
Metil-amina	max. 32%	+		
Metil-etil cetona	100%	+		

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N				
Naftalina		+	-	-
Nitrobenzen	100%	+	o	
O				
Oxid de etilena	100%	o		
P				
Parafina		+	o	
Peroxid de hidrogen (apa oxigenata)	max. 10%	+		
Petrol (hidrocarburi alifatic)		-	-	-
Piridina	100%	o		
Propan	100%	+		
S				
Suc de fructe		+	+	+
Suc de mere		+		
Sulfat de aluminiu		+	+	
Sulfat de bariu	Sat.	+	+	
Sulfat de calciu		+	+	
Sulfat de cupru	Sat.	+	+	
Sulfat de fier	Sat.	+	+	
Sulfat de magneziu	Sat.	+	+	
T				
Tetracolorura de carbon	100%	-	-	-
Tetrahidrofuran	100%	o	-	-
Tinctura de iod		+		
Toluen	100%	-	-	
Tricloretilena	100%	+	+	
U				
Ulei de masline		+	+	o
Ulei de ricin	100%	+		
Ulei parafinic (FL 65)		+	o	-
Ulei silconic		+	+	+
Uree		+	+	
Urina		+	+	
W				
White spirit	100%	o	-	
X				
Xilen	100%	-	-	-

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VALROM INDUSTRIE S.R.L.

Sediul social: B-dul. Preciziei, nr. 28, sector 6, București

**pentru următoarele activități/
for the following fields of activities**

Proiectare, fabricare și comercializare, service produse extrudate, injectate, sudate, strunjite din materiale termoplastice. Fabricare, achiziție, comercializare de sisteme și echipamente conexe pentru rețele de apă, gaz, canalizare, telecomunicații, instalații termice și sanitare

Design, manufacturing and sale, servicing of extruded, molded, welded, turned products made of thermoplastic materials. Manufacturing, acquisition, sale of related systems and equipment for water, gas, sewerage, telecommunications networks, heating and sanitary installations

Sediul de lucru: B-dul. Biruinței, nr. 151, Pantelimon, jud. Ilfov

**pentru următoarele activități/
for the following fields of activities**

Fabricare, comercializare produse rotoformate din materiale termoplastice. Fabricare și comercializare de echipamente conexe pentru rețeaua de apă, canalizare, telecomunicații și sanitare

Manufacturing, sale of rotoformed products made of thermoplastic materials. Manufacture and trade of related equipment for water networks, sanitation, telecommunications and sanitary

că are implementat și menține un
sistem de managementul calității
conform condițiilor din standardul

which has implemented and maintains a
quality management system
which fulfils the requirements of the standard

SR EN ISO 9001:2015 (ISO 9001:2015)



Valabilitatea certificatului este condiționată de
efectuarea supravegheților anuale până la data de:



nr. certificat/ certificate registration no. **8172**

data inițială a certificării/ initial certification date **29 noiembrie 2010**

data recertificării/ reissuing date *** 25 noiembrie 2022**

data ultimei actualizări/ last update -

valabil până la/ valid until **24 noiembrie 2025** (cu condiția vizării anuale)

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for the following fields of activities**

Proiectare, fabricare și comercializare, service produse extrudate, injectate, sudate, strunjite din materiale termoplastice. Fabricare, achiziție, comercializare de sisteme și echipamente conexe pentru rețele de apă, gaz, canalizare, telecomunicații, instalații termice și sanitare

Design, manufacturing and sale, servicing of extruded, molded, welded, turned products made of thermoplastic materials. Manufacturing, acquisition, sale of related systems and equipment for water, gas, sewerage, telecommunications networks, heating and sanitary installations

Sediul de lucru: B-dul. Biruinței, nr. 151, Pantelimon, jud. Ilfov

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for the following fields of activities**

Fabricare, comercializare produse rotoformate din materiale termoplastice. Fabricare și comercializare de echipamente conexe pentru rețeaua de apă, canalizare, telecomunicații și sanitare
Manufacturing, sale of rotoformed products made of thermoplastic materials. Manufacture and trade of related equipment for water networks, sanitation, telecommunications and sanitary

că are implementat și menține un
sistem de management de mediu
conform condițiilor din standardul

which has implemented and maintains an
environmental management system
which fulfils the requirements of the standard

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data recertificării/ reissuing date * **25 noiembrie 2022**

data ultimei actualizări/ last update -

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Design, manufacturing and sale, servicing of extruded, molded, welded, turned products made of thermoplastic materials. Manufacturing, acquisition, sale of related systems and equipment for water, gas, sewerage, telecommunications networks, heating and sanitary installations

Sediul de lucru: B-dul. Biruinței, nr. 151, Pantelimon, jud. Ilfov

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for the following fields of activities**

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Manufacturing, sale of rotoformed products made of thermoplastic materials. Manufacture and trade of related equipment for water networks, sanitation, telecommunications and sanitary

că are implementat și menține un
**sistem de management al sănătății
și securității ocupaționale**
conform condițiilor din referențialul

which has implemented and maintains an
**occupational health and safety
management system**
which fulfils the requirements of the reference standard

SR ISO 45001:2018 (ISO 45001:2018)



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nr. certificat/ certificate registration no. **3298**

data inițială a certificării/ initial certification date **12 decembrie 2014**

data recertificării/ reissuing date *** 25 noiembrie 2022**

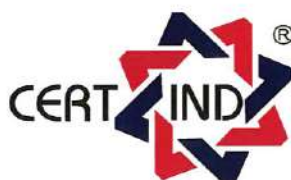
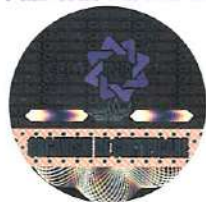
data ultimei actualizări/ last update -

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Director General
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CERTIFICAT

CERTIND

Confirmă faptul că sistemul de management al

VALROM INDUSTRIE SRL

cu sediu social în: București, bulevardul Preciziei, nr. 28, sector 6
locație secundară: Pantelimon, bulevardul Biruinței, nr. 151, județul Ilfov

este conform cu cerințele:

SR EN ISO 50001:2019/ ISO 50001:2018

având domeniul de certificare:

Proiectare, fabricare și comercializare, service produse extrudate, injectate, sudate, strunjite din materiale termoplastice. Fabricare, achiziție, comercializare de sisteme și echipamente conexe pentru rețele de apă, gaz, canalizare, telecomunicații, instalații termice și sanitare. Fabricare și comercializare produse rotoformate din materiale termoplastice. Fabricare și comercializare de echipamente conexe pentru rețeaua de apă, canalizare telecomunicații și sanitare.

- domeniul de certificare conform anexei -

Certificat nr.: 48047/123-40-En

Certificare inițială: 14.05.2020

Certificare curentă (recertificare): 03.05.2023

Data expirării ciclului de certificare: 13.05.2026 cu condiția vizării anuale a certificatului

Recertificarea trebuie finalizată până la data expirării ciclului de certificare

Organismul de certificare își rezervă dreptul de a suspenda, retrage sau anula prezentul certificat dacă, la auditurile de supraveghere se constată că nu au fost menținute condițiile de la data certificării inițiale.

CERTIND SA - ORGANISM DE CERTIFICARE
Palatul UGIR-1903, Str. George Enescu 27-29, Sector 1, București

DIRECTOR GENERAL
Violeta Sergentu



organism de certificare

Detalii privind veridicitatea acestui certificat pot fi obținute la CERTIND SA: telefon: 021.313.36.51; e-mail: office@certind.ro
Falsificarea acestui document se pedepsește conform legii.



Anexa la certificatul nr. 48047/123-40-En din 03.05.2023

Locatia	Tipul locatiei	Activitati desfasurate
Bucuresti, strada Preciziei nr. 28, sector 6	SEDIUL SOCIAL	Proiectare, fabricare si comercializare, service produse extrudate, injectate, sudate, strunjite din materiale termoplastice. Fabricare, achizitie, comercializare de sisteme si echipamente conexe pentru retele de apa, gaz, canalizare, telecomunicatii, instalatii termice si sanitare.
Pantelimon, strada Biruintei, nr. 151, judetul Ilfov	LOCATIE SECUNDARA	Fabricare si comercializare produse rotoformate din materiale termoplastice. Fabricare si comercializare de echipamente conexe pentru rețeaua de apa, canalizare, telecomunicatii si sanitare.

Aceasta anexa este valabila numai insotita de Certificatul de Conformitate CERTIND Nr. 48047/123-40-En

DIRECTOR GENERAL
Violeta Sergentu





BENOR

BCCA

BENOR CERTIFICATE

issued on the basis of the provisions of the Implementation Rules for BENOR certification
of plastics piping systems for non-pressure underground drainage and sewerage, TRA BB 601,
to the company

Deschacht Plastics Belgium nv
Antwerpsesteenweg 1068, BE - 9041 Oostakker,

for the production of

**Buried PP manholes and inspection chambers (DN400-1200) in
traffic areas and deep underground installations in non-pressure
drainage and sewerage systems with a maximum depth of 6m from
ground level to the invert of the main chamber**

manufactured in the production unit

Kaczmarek Malewo Spółka Jawna
Ul. Gostynska 12, PL - 63-820 Piaski,

in accordance with the

**NBN EN 13598-2: 2020 "Plastics piping systems for non-pressure underground drainage and
sewerage - Unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE) -
Part 2: Specifications for manholes and inspection chambers"**

By issuing the certificate, BCCA declares that, on the basis of (I) the initial assessment of the product characteristics by means of testing; (II) the initial evaluation and acceptance of the quality assurance in production; (III) the regular external control of the implementation of the quality assurance processes and the control schemes agreed upon; (IV) regular control tests in a recognised external laboratory, sufficient confidence can be given to the measures taken by the certificate holder for guaranteeing conformity with the prescriptions.

The annex to this certificate gives the data with regard to the certified product. This document is an annex to the certificate and is authenticated by BCCA.

Following the issuing of this certificate and as long as it is maintained valid, BCCA grants the right to use the BENOR mark to the certificate holder. The proof of delivery of a product under the BENOR mark is given by a suitable identification on the product or, if this isn't possible, on the packaging. The use of the BENOR mark does not relieve the certificate holder of his responsibilities with regard to the delivered product.

The validity of this certificate can be checked via www.bcca.be.

N° certificate BB-601-4146-13598-2 PP-4604-35578 | Valid from 2022-12-01 until 2025-11-30

Issued in Brussels, on 23 January 2023.


ir. B. De Blaere,
President of the General management
Committee for certification and approval

The BENOR mark is a registered collective mark, that is the property of the Bureau for Standardisation (NBN). The BENOR certification is a voluntary system that is established on the basis of a consensus between stakeholders and is a response on the request of the user to have sufficient certainty about the aspects with regard to, ex., quality, public security, suitability for use, health and the interests of the end users.

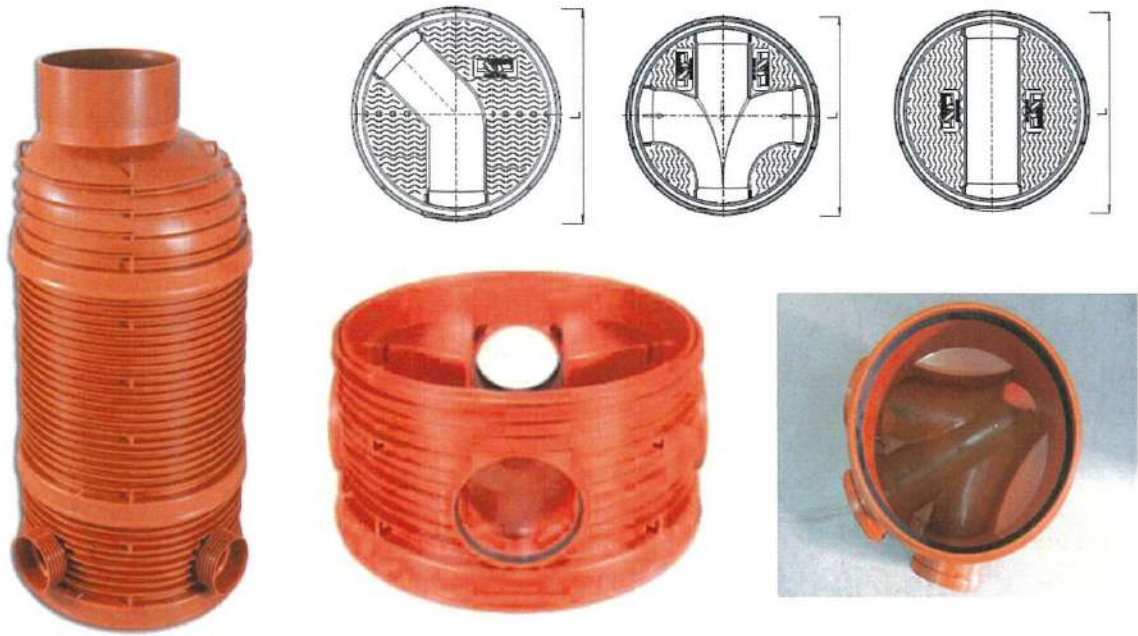
BELGIAN CONSTRUCTION CERTIFICATION ASSOCIATION NPO
REGISTERED OFFICE : CANTERSTEEN, 47 BE-1000 BRUSSELS
OPERATIONAL OFFICE : HERMESLAAN, 9 BE-1831 DIEGEM
TEL. + 32 2 238 24 11
MAIL@BCCA.BE | WWW.BCCA.BE



Annex to the BENOR Certificate BB-601-4146-13598-2 PP-4604-35578

Buried PP manholes and inspection chambers (DN400-1200) in traffic areas and deep underground installations in non-pressure drainage and sewerage systems with a maximum depth of 6m from ground level to the invert of the main chamber

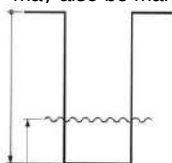
Version 2 of 23 January 2023

Internal diameter	Technical specifications
DN 400 – 1000	- PP Manholes and inspection chambers, composed of injection moulded elements, assembled by extrusion welding or with sealing rings - Maximum dept of 6m and maximum water table height of 5m from the invert of the main chamber - Profiled invert
	

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Marking:

- applied directly in production in the mould and/or on stickers, applied on the inside as well as on the outside
- Contains: BENOR – EN 13598-2 – Kaczmarek – U* - dimensions (DN) – PP – production date – maximal depth (6m) and water table height (5m)**
- *U : application area code for non-pressure underground drainage and sewerage buried in ground outside the building structure
- ** may also be marked as following drawing :



This annex is valid as long as the BENOR certificate remains valid.

Issued in Brussels, on 23 January 2023.



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Certificate

Standard **ISO 9001:2015**

Certificate Registr. No. **01 100 1331951**

Certificate Holder: **Kaczmarek Malewo
Spółka Komandytowa**
Malewo 1
63-800 Gostyń
Poland

including the locations according to annex

Scope: production and distribution of plastic products for building gas-,
water-sewerage, sewage-, gutter-, cable protection, land
melioration systems and tubular plates

Proof has been furnished by means of an audit that the
requirements of ISO 9001:2015 are met.

Validity: The certificate is valid from 2023-07-09 until 2026-07-08.
First certification 1999

2023-07-04



TÜV Rheinland Cert GmbH
Am Grauen Stein · 51105 Köln

Nr.crt.	Specificatii tehnice impuse prin Caietul de sarcini	
1	Parametrii tehnici si functionali: - Mediu de lucru: retea de canalizare fara presiune - Etanseitate 100%, la -0,3 bar conform SR EN 1277 - Rigiditate inelara a inaltatorului >SN2kN/mp conform EN ISO 14982-2 - Rezistenta la temperatura : max.45 grade conform SR EN 1437 - Modul E de scurta durata 1250 N/mm²; - Fabricate din PP, material virgin, utilizarea de materiale reciclate, aditivi fiind interzisa conform normativ EN 14830; - Conexiunea dintre elemente se va face cu garnituri elastomerice fabricate conform normativ EN 681-2+A1+A2:2006 - Material camin modular PP ID1000: - MFI – 0,3 Gr/10min (ISO 1133 / (230 C° / 2.16); - Densitatea – 900 kg/m3 (ISO 1183); - Rezistenta la incovoiere – 1500-2000 MPa (ISO 527-2); - Rezistenta tractiune 26°C – 35 MPa (ISO 527-2); - Rezistenta a impact – 2,20 kJ/m2 (-20 C°).	Parametrii tehnici si functionali: - Mediu de lucru: retea de canalizare fara presiune - Etanseitate 100%, la -0,3 bar conform SR EN 1277 - Rigiditate inelara a inaltatorului >SN2kN/mp conform EN ISO 14982-2 - Rezistenta la temperatura : max.45 grade conform SR EN 1437 - Modul E de scurta durata 1250 N/mm²; - Fabricate din PP, material virgin, utilizarea de materiale reciclate, aditivi fiind interzisa conform normativ EN 14830; - Conexiunea dintre elemente se va face cu garnituri elastomerice fabricate conform normativ EN 681-2+A1+A2:2006 - Material camin modular PP ID1000: - MFI – 0,3 Gr/10min (ISO 1133 / (230 C° / 2.16); - Densitatea – 900 kg/m3 (ISO 1183); - Rezistenta la incovoiere – 1500-2000 MPa (ISO 527-2); - Rezistenta tractiune 23°C – 35 MPa (ISO 527-2); - Rezistenta a impact – 2,20 kJ/m2 (-20 C°).
2	Specificatii de performanta si conditii privind siguranta in exploatare: - Respectarea conditiilor de temperatura: -20 ÷ 60°C; - Amplasare: retea de canalizare fara presiune; - Montarea se va face conform instructiunilor de montare date de producator.	Specificatii de performanta si conditii privind siguranta in exploatare: - Respectarea conditiilor de temperatura: -20 ÷ 60°C; - Amplasare: retea de canalizare fara presiune; - Montarea se va face conform instructiunilor de montare date de producator.
3	Conditii privind conformitatea cu standardele relevante: - Standard productie: EN 13598-1, EN 13598-2; - Certificari obligatorii: ISO 9001/ISO 14001 SAU ISO 45001 sau 45001/ ISO 50001 / ISO 27001; - Obligativu Aviz si Evaluare tehnica emis de autoritatile din Republica Moldova; - Laborator propriu de incercari.	Conditii privind conformitatea cu standardele relevante: - Standard productie: EN 13598-1, EN 13598-2; Certificari obligatorii: ISO 9001/ISO 14001 - Conform legii, produsele trebuie certificate la momentul importului in tara. Daca oferta noastra va fi declarata castigatoare, fiecare lot va fi certificat separat la import de catre organismele acreditate din Rep Moldova conform schemei de certificare nr 1 aprobata de Moldac. Laborator propriu de incercari.
4	Conditii de garantie si post-garantie: - Minim 24 luni de la livrare. - Furnizorul va asigura service in perioada de garantie. - Furnizorul va asigura piese de schimb pe baza de comanda in perioada post-garantie.	Conditii de garantie si post-garantie: - Minim 24 luni de la livrare. - Furnizorul va asigura service in perioada de garantie. Furnizorul va asigura piese de schimb pe baza de comanda in perioada post- garantie.

5	Alte conditii cu caracter tehnic: Caminele de vizitare modulare ID1000 sunt produse cu tehnologii de injectare sub presiune de ultima generatie pentru a garanta: — Grosimea stratului peretelui conform normativelor in vigoare; — Prezenta nervurilor de ranforsare la exterior pentru o rezistenta sporita; — Structura compacta si neteda la interior; — Trepte de acces integrate in corpul modular al caminului si in corpul de inchidere cu structura anti-alunecare pentru asigura siguranta in exploatare; — Modulare pentru a facilita punerea in opera si manipularea acestora: baza camin ID 1000, corpul modular camin ID 1000, corp inchidere camin ID 1000 / OD 680, garnitura 645 si inel din beton intarit cu fibra de sticla OD/ID 1100/665; — Canal de dirijare a apei integrate in baza camin ID 1000, racorduri teava care sa permita trecerea apei fara denivelari sau alte obstacole cu posibilitate de racordare orice tip de teava, conform normativ: EN 681-2+A1+A2:2006; — Con pentru linistire ape in cazul caminelor cu rupere de pante; — Unghiurile de conectare IESIRE – INTRARE: 0 - 90°, 0 - 105°, 0 - 120°, 0 - 135°, 0 - 150°, 0 - 165°, 0 - 180°, 0 - 195°, 0 - 210°, 0 - 225°, 0 - 240°, 0 - 255°, 0 - 270°; — Racordare bransamente: garnitura D.110 – 200, sudura D. 250 – D.400.	Alte conditii cu caracter tehnic: Caminele de vizitare modulare ID1000 sunt produse cu tehnologii de injectare sub presiune de ultima generatie pentru a garanta: — Grosimea stratului peretelui conform normativelor in vigoare; — Prezenta nervurilor de ranforsare la exterior pentru o rezistenta sporita; — Structura compacta si neteda la interior; — Trepte de acces integrate in corpul modular al caminului si in corpul de inchidere cu structura anti-alunecare pentru asigura siguranta in exploatare; — Modulare pentru a facilita punerea in opera si manipularea acestora: baza camin ID 1000, corpul modular camin ID 1000, corp inchidere camin ID 1000 / OD 690, garnitura 645 si inel din beton OD/ID 1100/665; — Canal de dirijare a apei integrate in baza camin ID 1000, racorduri teava care sa permita trecerea apei fara denivelari sau alte obstacole cu posibilitate de racordare orice tip de teava, conform normativ: EN 681-2+A1+A2:2006; — Sistem pentru linistire ape in cazul caminelor cu rupere de pante; — Unghiurile de conectare IESIRE – INTRARE: 0 - 90°, 0 - 105°, 0 - 120°, 0 - 135°, 0 - 150°, 0 - 165°, 0 - 180°, 0 - 195°, 0 - 210°, 0 - 225°, 0 - 240°, 0 - 255°, 0 - 270°; — Racordare bransamente: garnitura D.110 – 200, sudura D. 250 – D.400.
6	Dimensiuni elemente camine modulare ID1000: Baza camin PP modular ID1000 – 3intrari – 1 iesire — IN/OUT – D110-315mm; Hutil=407mm; L=1086mm; Himbinare=100mm; — IN/OUT – D110-500mm; Hutil=602mm; L=1086mm; Himbinare=100mm.	Dimensiuni elemente camine modulare ID1000: Baza camin PP modular ID1000 – 3intrari – 1 iesire — - IN/OUT-0.200; Huseful=444mm; L=1096mm; Hjoint=151mm; — - IN/OUT-0.250; Huseful=460mm; L=1096mm; Hjoint=135mm; — - IN/OUT-0.315; Huseful=475mm; L=1096mm; Hjoint=120mm; — - IN/OUT-0.400; Huseful=496mm; L=1096mm; Hjoint=99mm; — - IN/OUT -0.500; Huseful=705mm; L=1096mm; Hjoint=140mm;

Extensie camin PP modular ID1000 – Hutil=250mm; Htotal=320mm; – Hutil=500mm; Htotal=570mm; – Hutil=750mm; Htotal=840mm; – Hutil=1000mm; Htotal=1090mm. Corp inchidere camin PP modular ID1000 – DN/OD – 680mm; Hutil=726mm; Hextensie=316mm; Himbinare=90mm. Con linistire rupere panta – Diametru scurgere=160mm; Hutil=220mm; Htotal=270mm. In mod obligatoriu va fi prevazut cu sistem click-clack de blocare : – Intre baza si extensie; – Intre extensii; – Intre extensii si corp inchidere Sistemul de click-clack trebuie sa fie prevazut din constructia elementelor.	Extensie camin PP modular ID1000 – Hutil=250mm; Htotal=345mm; – Hutil=500mm; Htotal=595mm; – Hutil=750mm; Htotal=845mm; – Hutil=1000mm; Htotal=1095mm. Corp inchidere camin PP modular ID1000 – DN/OD – 660mm; Hutil=766mm; Hextensie=316mm; Himbinare=120mm. Disipator de energie Uneori este necesar să conectați un canal la cămin deasupra bazei caminului. Apoi, se construiește așa-numit cămin de fundal. Conform standardului PN-8-10729, „caminele cu fundal în canale cu diametre de până la 0,40 m și înălțimea căderii de la 0,5 - 4,0 m pot fi construite cu o țeavă de fundal plasată în interiorul sau exteriorul căminului. Într-un camin de inspectie fara intrare, conducta de scurgere nu poate fi instalata. Aceasta înseamnă că pentru camerele de inspectie fără intrare, dacă diametrul canalului nu depășește 160 mm, conectarea poate fi realizată printr-un orificiu într-o țeavă de extensie. Dacă teava este de tip K2-Kan structurată, trebuie introdus un fitting special (adaptor manseta din PVC) ce se instaleaza in garnitura, teava de scurgere nu se instaleaza. Iar daca diametrul depășește 200 mm, trebuie utilizată o țeavă de fundal și trebuie conectată la piesa de bază a caminului. O conexiune teu este conectat la țeava de fundal (după reducerea diametrului la 60 mm.) este conectat la o teava ce extensie (cu o garnitura). In mod obligatoriu va fi prevazut cu sistem click-clack de blocare : Caminele propuse nu au nevoie de sistem click-clack de blocare pe motiv ca garnitura (intalime garnitura 30mm) si sistemul de imbinare a corpurilor cominului (buza de prindere garnitura de minim 10mm)sunt proiectate astfel incat sa nu permita dezasamblarea la forte orizontale ci doar la forte verticale de jos in sus, care sunt imposibil sa apara la un camin montat subteran. Fortele care apasa asupra unui camin subteran sunt verticale de sus in jos, orizontale si oblice de sus in jos. Un dezavantaj al sistemului click-clack este acela ca in momentul in care se doreste dezasamblarea caminului, sistemul click-clack trebuie fortat sau chiar rupt motiv pentru care piesele resective nu mai pot asigura sigurnata caminului.
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DATA SHEET

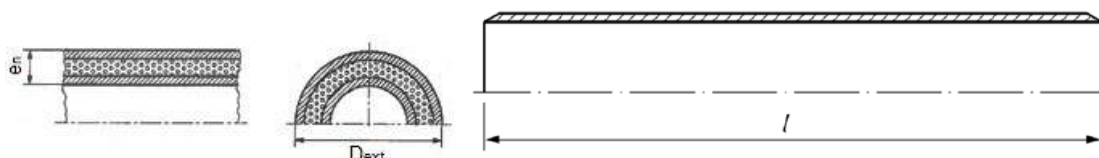
PP-HM MULTILAYER PIPE <KompactKIT> D.110÷400mm SN8

1. Field of use

- Polypropylene PP HM multilayer pipes are used for non-pressure underground sewerage networks without pressure (gravitational sewerage in which the flow is at a free level) for the transport of domestic and meteoric wastewater. The pipes are installed buried in the ground.

2. Technical features

- Reference Standard: SR EN 13476-2 "Plastics piping systems for non-pressure underground drainage and sewerage - structured-wall piping systems of unplasticized poly (vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE). Part 2: Specifications for pipes and fittings with smooth internal and external surface and the system, type A".
- The pipes are manufactured by co-extrusion.
- Materials:
 - the outer and the inner layer are made of polypropylene type PPHM (Polypropylene High Modulus),
 - The intermediate layer is made of polypropylene PP B (Polypropylene block copolymers) with modified minerals.
- Color: the outer and inner layers are orange-brown (RAL 8023) and the intermediate layer is white or black.
- The pipes are chamfered at both ends. PP SN8 S13.3 plugs are used for connection which are delivered together with the pipe.
- The pipes have stiffness class SN8, determined according to ISO 9969, $SN \geq 8 \text{ kN/m}^2$.
- Longitudinal reversion, determined according to EN ISO 2505: max. 2%
- Appearance: when examined with naked eye (no magnifying instruments) surfaces must be smooth, clean, without burrs, pores or other surface defects that can affect the performance of pipes. The ends to be connected must be cut clean and perpendicular to the axis of the pipe.
- Dimensions:



Valrom Industrie SRL

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cod 062204, București
Tel: + 4 021 317 38 00;
Fax: + 4 037 289 94 45;
www.valrom.ro; office@valrom.ro

REG COM J40/4810/1996

CIF RO8529679

Capital social: 6.706.000 lei

Nominal diameter DN [mm]	Outer diameter Dext. [mm]	e _n minimum [mm]	l [m]	Item
110	110 – 110,3	3,7	6	35058110600
125	125 – 125,3	4,2	6	35058125600
160	160 – 160,5	5,5	6	35058160600
200	200 – 200,5	6,9	6	35058200600
250	250 – 250,5	8,6	6	35058250600
315	315 – 315,6	10,4	6	35058315600
400	400 – 400,7	13,7	6	35058400600

e_n minimum = minimum pipe thickness

l = pipe length.

Marking:

- **Manufacturer's name:** Valrom
- **brand:** KompactKIT
- **MADE IN ROMANIA**
- **Nominal outer diameter:** Ø.... (mm)
- **field of use code:** U
- **stiffness class:** SN8
- **standard:** EN 13476 - 2
- **material:** PP-HM
- **information for traceability:** LOT xxyy (xx - the last two digits of the year, yy - serial number of the lot); date day and month (xx, yy); hour and minute

3. Packing, handling, transport and storage

- For transport of pipes use vehicles with flat surface, without roughness, which will not damage the pipes. Pipes should be supported along their length to avoid damage to the extremities due to vibration.
- When loading and unloading pipes with forklifts care should be taken not to hit the pipes. When handling pipes, it is good to use non-abrasive straps (nylon, hemp or similar). If steel cables are used it is necessary to protect the pipes in the contact area. In cold periods, at freezing temperatures, pipes are prone to damage in case of impact. It is recommended to handle the pipes with maximum attention.
- It is recommended to load the heavier pipes first to avoid deformation of the lighter ones.
- Pipes will be stored on flat, stable surfaces, in areas covered and protected against fire, frost, UV radiation and major thermal variations.
- Temporary storage on the site must be made so that the pipes are not damaged, special attention will be paid to keeping the section of the pipe ends intact to not compromise the joint.
- It is recommended that during the cold season, all the pipes should be stored on the supports to avoid freezing.
- Pipes and gaskets shall be kept away from contact with fuels, solvents, oils, greases, paints or heat sources.

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- The height of the storage stack will not exceed 1 m regardless of the diameter of the pipe, to avoid deformation of the pipes from the base.
- If the pipes were delivered in the package then the package will be opened only a short time before the installation in the ditch.

4. Warranty and service life:

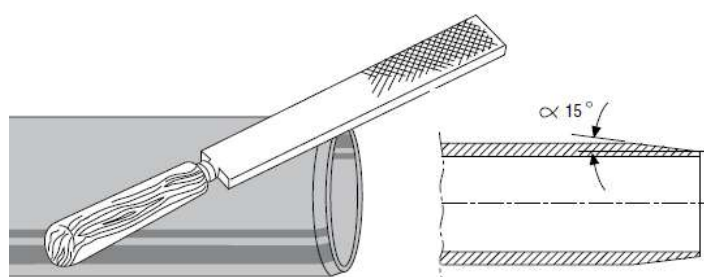
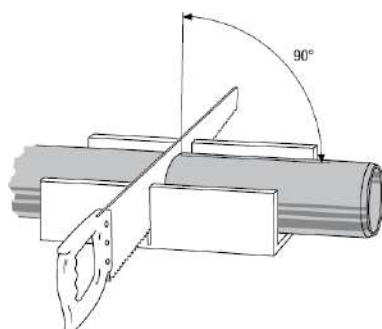
- Service life is 50 years.
- Warranty is 5 years from the date of delivery, provided that the instructions for transport storage, handling and installation are observed.

5. Installation instructions:

- Polypropylene material cannot be glued, so for side joining use mechanical saddle and mechanical couplers <KompactKIT>.
- Assembly stages:
 - Before joining, the elements should be cleaned carefully, they will be checked to be intact.
 - Temporarily remove the seal gasket.
 - Insert pipe spigot into the socket up to the stop and mark the position. The pipe will be withdrawn about 3 mm for each meter of pipe, but not more than 10 mm. The reference line will be marked.
 - Insert the sealing gasket correctly back into the socket.
 - Lubricate interior surface of gasket and exterior surface of pipe spigot with proper lubricant (silicone oil, soap with water etc.). Do not use oil or grease.
 - Push pipe spigot into the socket until the marked line. The success of this operation depends on the exact alignment of the pipes and lubrication.

Cut the pipe with a fine tooth saw .

The cut will be perpendicular on longitudinal pipe axis. Chamfer and bevel the pipe to an angle roughly 15° using a suitable chamfering tool or a fine file.



- PP multilayer pipes belong to the category of flexible pipes. The characteristic of flexible pipes is that under loads they deform significantly without being damaged. To limit the deformation of the pipe, it is very important that the lateral filling is compacted as correctly as possible. The required degree of compaction is established by the project.

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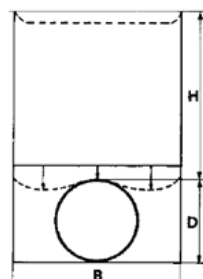
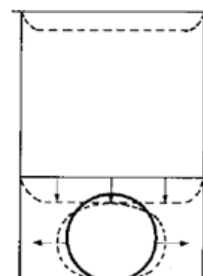
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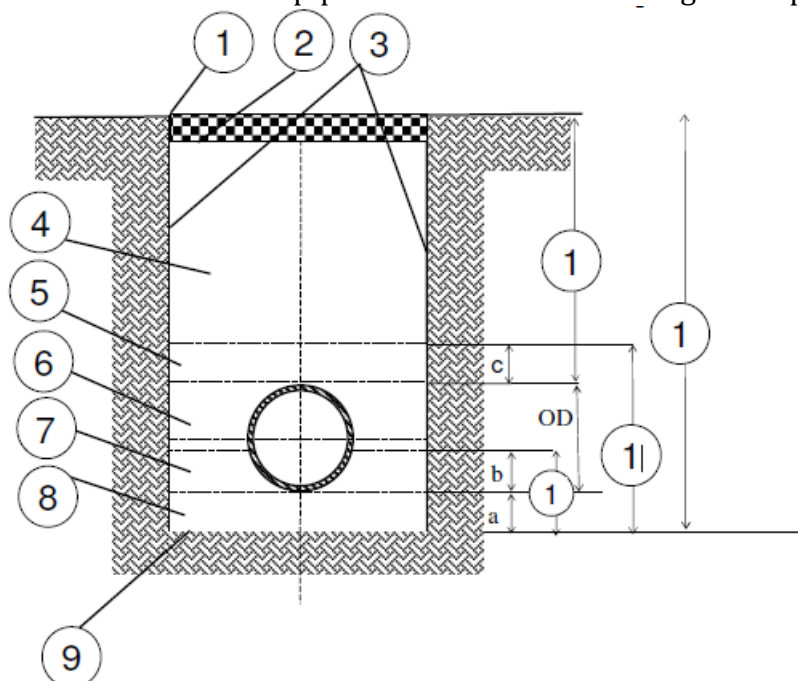
CIF RO8529679

Capital social: 6.706.000 lei

- The correct choice of the filling material and the correct execution of the installation are factors that can limit the deformation of the pipe.

Deformation in the trench of rigid pipes

Deformation in the trench of flexible pipes


The installation of the pipes is carried out according to the provisions of the project.



- 1 surface
 2 the basis of the road infrastructure
 3 the walls of the trench
 4 the actual filling
 5 the first filling
 6 lateral filling
 7 upper bed, b
 8 bottom bed, a
 9 trench bottom

- 10 Cover height
 11 The height of the support
 12 The height of the special filling
 13 Trench depth
 a thickness of the lower bed
 b thickness of the upper bed
 c thickness of the first filling
 OD the outside diameter of the pipe

General laying conditions:

Multilayer PP pipes are generally installed at depths of at least 1.20 m. In the case where they are laid in areas without traffic, the minimum depth can be reduced to the minimum frost depth.

For SN8 PIPES the depth of laying in trench is between 1.2 m ÷ 6.0 m, measured from the upper generator of the pipe, installed in narrow or wide trench, heavy road traffic, maximum 18 tones/axis, in compliance with positioning instructions.

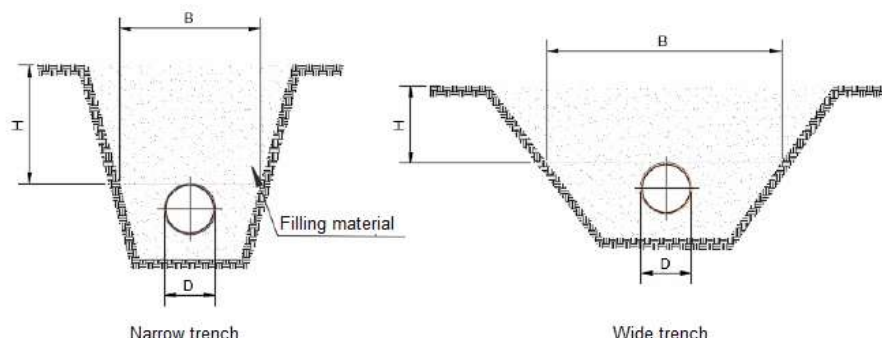
Width of the trench

Trench width is established by the project, it must ensure necessary space for joints inside it and compacting the filling in the pipe area.

Trench width must not exceed the maximum value established by the project.

Classification of the trench:

Type of trench	B	
Narrow trench	$\leq 3 D$	$< H/2$
Wide trench	$> 3 D$ $< 10 D$	$< H/2$
Infinite trench	$\geq 10 D$	$\geq H/2$



Bottom trench

Bottom trench must be dry (without groundwater or meteoric waters), continuous, flat and without stones.

Material and gradient of trench must be in accordance with project specifications. It is recommended not to change the bottom of the trench, if it has been modified, the initial bearing capacity must be restored.

If the trench bottom is unstable or the soil is compressible, appropriate measures should be provided.

In the case of lands with high content of organic substances, unstable (peat or flowing sand) etc., it is necessary to design a support layer on bottom trench. The nature and composition of the support layer are determined by the designer.

In case of frost it is necessary to protect the bottom of the trench so that the frozen layers are not left below or around the pipe.

Bedding

The bedding consists of upper and lower bedding. In the case of the pipe laid on natural trench bottom, the trench bottom is the lower bedding.

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The role of the bed is to provide continuous support throughout the entire length of the pipe.

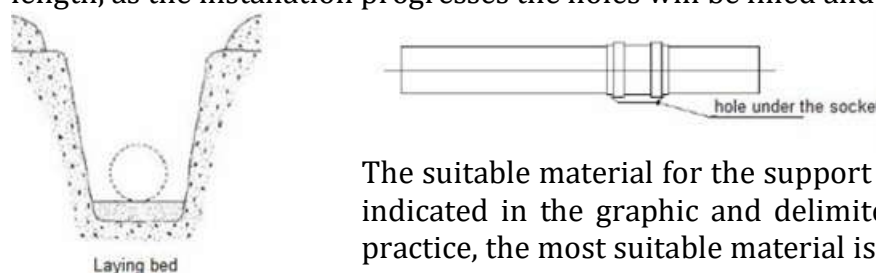
The materials used for embedment shall comply certain requirements in order to be capable of providing permanent stability and load bearing capacity for the pipeline buried in the ground.

Materials used for bedding should contain no particles with size above 20 mm for pipes with $D < 200$ mm and 40 mm for pipes with diameter between 200 and 630 mm.

Native soil can be re-used if shall meet all the following requirements: it is permitted by the project; it complies with any compactability requirements in the design; it is free from materials detrimental to the pipe (oversized particle, tree roots, waste, organic material, snow and ice) and any clay larger than 75 mm.

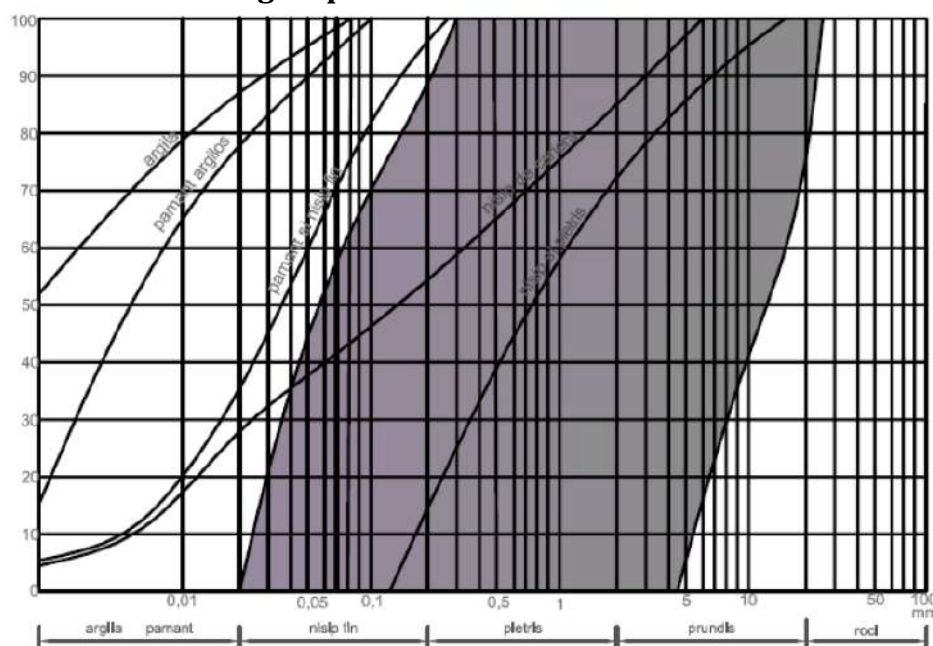
The lower bedding layer should generally have a thickness of 10 cm to 15 cm. The bedding material is spread over the entire width of the bottom of the pit and is leveled at the slope of the pipe.

Next to the coupling sockets small holes will be dug, in this way the pipe will rest its entire length, as the installation progresses the holes will be filled and compacted carefully.



The suitable material for the support and for the lateral filling is indicated in the graphic and delimited by the hatched area. In practice, the most suitable material is composed of gravel with a size of 10-15 mm or sand mixed with gravel with a maximum size of 20 mm.

Granulometric curves. Soil group



Horizontal: The diameters of the granules that correspond to the inner dimensions of the sieve meshes (mm); **Vertical:** Cumulative weights of the fractions that passed through the sieve, calculated as a percentage of the total weight (%)

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 DEPARTMENT OF TECHNICAL CONSULTANCY AND DOCUMENTATIONS

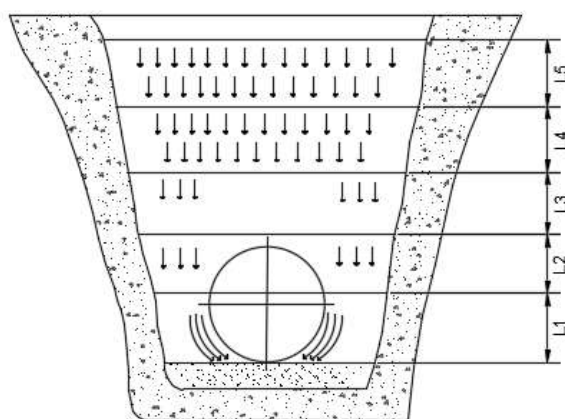
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Filling procedure

Manual filling in pipe area is the most important because of this depends the formation of the support bed for pipe and behavior in operation at external mechanical demands.

The filling around the pipe and the filling itself must be undertaken only when the state of the support and the connection of the pipes allow to withstand the loads.

The material already used for the construction of the bed will be placed around the pipe and compacted manually (well beaten with rammer and moistened to the limit for maximum tightening), in thin layers (10 cm) to the middle line of the pipe, taking great



care not to remain empty areas under the pipe and that the lateral parts between the pipe and the walls of the excavation are continuous and compact (layer L1).

The second layer of the side L2 will reach the upper generator of the pipe. Filling and compaction should be performed simultaneously on both sides of the pipe to prevent unwanted movement of the pipe.

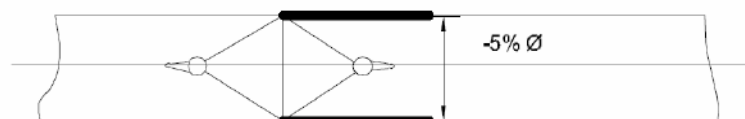
The third layer L3, will reach a higher dimension by 15 cm than the upper generator of pipe.

In layer L3 the compaction should be applied to the pipe only laterally and not above it. The subsequent filling (layers L4 and L5) will be carried out with the help of the earth that comes from the excavation cleaned of elements with a larger dimension > 100 mm, of roots, waste, organic materials, snow, ice or clay bulges larger than 75 mm. In areas where no compaction is required, elements with a maximum size of up to 300 mm are accepted if the ridge of the pipe has been covered.

The resulting Proctor index must be higher than the level provided by the designer. The compaction technology is performed in accordance with the calculations for checking the resistance of the pipe to earth loads and other demands. The last layer that sits is the vegetable layer.

Checking the diameter deformation

The vertical variation of the inner diameter of the pipes should be inspected, in order to verify the conformity with the mechanical resistance calculation. In general the maximum deformation of the pipe must not exceed 5 - 6%. This limit value is imposed due to network exploitation considerations. The verification can be carried out with the help of mechanical instruments (sphere or double cone) or with the help of optical instruments (cameras). From the reception procedure are excluded, due to the difficulties of implementation, the parts of the pipe that include special parts.



In cases where there are higher values of deformation than those established above, it is necessary to examine the cause.

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Tightness test

It is carried out according to the prescriptions of the project and the national provisions in force:

NP 133 Normative regarding the design, execution and exploitation of the water supply and sewage systems of localities.

STAS 3051-91: Sewage systems. Channels of external sewerage networks. Fundamental design requirements

Testing of pipes in sewerage networks, according to NP 133:

The tightness test of the sewerage networks is carried out according to the provisions of STAS 3051. The tightness test is carried out on sections of maximum 500 m.

Before must be done:

- a) partial fillings leaving the joints free
- b) tight closures for all openings
- c) blocking of extremities and points susceptible to movement during the test.

OBSERVATIONS:

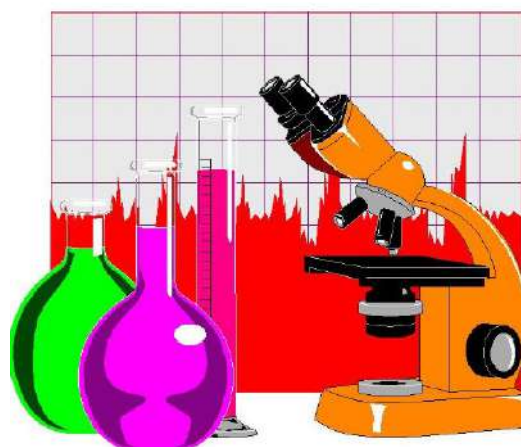
- According to EN 13476, PVC fittings with resistance class SDR 41 (according to EN 1401-1) and PP fittings with resistance class S16 (comp. EN 1852-1) can be used with pipes with ring stiffness SN4 or SN8.
- If it is desired to use PP multilayer pipes with chemically contaminated waste water (e.g. industrial water), the chemical resistance of the pipes must be evaluated in the design (see Appendix: Chemical resistance of polypropylene) and the use temperature must be taken into account.
- To evaluate the behavior of the sealing gasket, the document ISO/TR7620 *Chemical resistance for rubber materials should be consulted.*

ANNEX THE CHEMICAL RESISTANCE OF POLYPROPYLENE

Chemical resistance of polypropylene as it is specified in the document ISO/TR 10358:1993 Plastics pipes and fittings - Combined chemical-resistance classification table.

The information represents a summary of the data regarding the chemical resistance of polypropylene PP, presented in different public sources, derived both from practical experience and from laboratory tests.

The evaluation was done by immersing a material sample in the respective fluid at 20°, 60° and 100°C, at atmospheric pressure - in the absence of internal pressure and other external mechanical stresses - followed by the determination of the traction characteristics.

**Notes:**

1. In the tables, the concentrations of the solutions are expressed by mass.

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2. The information provided in this technical bulletin refers only to chemical resistance. Because generally other factors are involved, such as permeability, product geometry, etc. it is recommended to test the compatibility of the material for each individual use.

Definitions, symbols and classifications:

• **chemical resistance:** the ability of a material (plastic) to resist (modify the initial characteristics at a minimal level) after exposure to a fluid or direct contact with a certain substance (such as acids, bases, oils, fats, etc.) ; chemical resistance is assessed by determining some mechanical characteristics determining the conditions of use: loss of mass, degree of swelling, tensile stress-deformation characteristics, etc.

• **resistant: +**

the material is not affected or the effect is minor and difficult to quantify; stable in the long term.

• **limited resistance: o**

the environment may swell the PP or induce limited chemical changes. The use is restricted in terms of pressure and temperature and the shortening of the service life must be taken into account.

• **not recommended: -**

the effect produced is severe and the use of PP in contact with this fluid is **NOT** recommended

• **Sat.:** saturated aqueous solution, obtained at 20°C

• **Soil:** aqueous solution at a concentration of $\geq 10\%$ but unsaturated

• **Soil. dil:** diluted solution at a concentration $\leq 10\%$

• **Soil. ind.:** aqueous solution at the usual concentration for industrial use

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BULETIN TEHNIC TC003 – Rezistența chimică a polipropilenei

4. Rezistența chimică

Denumire	Condiții	Temperatură, °C		
		20	60	100
A				
Acid azotic	60%	+	-	
Acetat de butil	100%	+	o	o
Acetat de etil	100%	o	o	
Acetat de metil	100%	+	+	
Acetat de pentil	100%	o		
Acetat de plumb	Sat.	+	+	
Acetofenona	100%	o	o	
Acetona	100%	+	+	
Acid acetic	max. 40%	+	+	
Acid acetic	50%	+	+	
Acid acetic	10%	+	+	
Acid acetic	97%	+	o	
Acid azotic	fumans	-	-	
Acid azotic	70%	-	-	
Acid benzoic		+	+	
Acid boric		+	+	
Acid carbonic		+	+	
Acid citric	10%	+	+	
Acid cloracetic	Sat.	+		
Acid clorsulfonic	100%	-	-	-
Acid formic	100%	+		
Acid fosforic	95%	+	+	
Acid hidroxi-acetic	30%	+		
Acid lactic	max. 90%	+	+	
Acid oleic	100%	+	o	
Acid oxalic				
Acid sulfuric	max. 10%	+	+	+
Acid sulfuric	50%	+	o	o
Acid sulfuric	96%	+	o	-
Acid tanic	10%	+	+	
Acid tartric		+	+	
Acid trichloracetic	10%	+	+	
Acizi grasi (C6)	100%	+	+	
Alcool benzoic	Sat.	+	+	
Alcool etilic	max. 95%	+	+	+
Alcool izopropilic	100%	+	+	+
Alcool metilic	5%	+	o	o
Amoniac (sol apoasa)	max. 30%	+		
Anilina	100%	+	+	
Apa de mare		+	+	+
Apa distilata	100%	+	+	+
Apa regala		o	o	
Azotat de calciu		+	+	
Azotat de cupru	Sat.	+	+	
Azotat de fier	Sat.	+	+	
Azotat de magneziu	Sat.	+	+	
B				
Benzen	100%	o	-	-
Benzina		-	-	-
Borax	Sol.	+	+	
Butanol	100%	+	o	o
Butil glicol	100%	+		
C				
Carbonat de bariu	Sat.	+	+	
Carbonat de calciu	Sat.	+	+	+
Carbonat de magneziu	Sat.	+	+	
Carbonat de sodiu	max. 50%	+	+	o
Cerneala		+	+	
Cetone		+		
Cianura de cupru	Sat.	+	+	
Ciclohexan	100%	+		
Ciclohexanol	100%	+	o	
Ciclohexanona	100%	o	-	-

Denumire	Condiții	Temperatură, °C		
		20	60	100
Clor (lichid)	100%	-	-	-
Clor (sol apoasa)	Sat.	+	o	
Clorbenzen	100%	-	-	
Cloretanol	100%	+		
Cloroform	100%	o	-	-
Clorura de aluminiu		+	+	
Clorura de amoniu	Sat.	+		
Clorura de bariu	Sat.	+	+	
Clorura de calciu	Sat.	+	+	+
Clorura de cupru	Sat.	+	+	
Clorura de etil	100%	-	-	
Clorura de fier	Sat.	+	+	
Clorura de magneziu	Sat.	+	+	
Clorura de nichel	Sat.	+	+	
Clorura de sodiu	20%	+	o	-
Combustibil aviatie (115/145 octan)		o	-	
Crezol	peste 90%	+		
D				
Decalina (decahidronaftalena)	100%	-	-	-
Detergenti	2%	+	+	+
Dibutilftalat	100%	+	o	-
Dicloretilena	100%	+		
di-etanol amina	100%	+		
di-etilen glicol	100%	+	+	
Diizooctil-ftalat	100%	+	+	
di-metil amina	100%	+		
di-metil formamida	100%	+	+	
Dioxan	100%	o	o	
Dioxid de sulf (umed sau uscat)	100%	+	+	
Disulfura de carbon	100%	o	-	
E				
Emulsifianti		+	+	
Emulsii acrilice		+	+	
Etanolamina	100%	+	+	
Eter izopropilic	100%	+	+	+
Etilenglicol	100%	+	+	+
F				
Fenol	5%	+	+	
Fenol	90%	+		
Formaldehida	40%	+		
Fosfat de calciu	50%	+		
Furfurol	100%	-	-	
G				
Glicerina	100%	+	+	+
Glicol		+	+	
H				
Heptan	100%	o	-	-
Hexan	100%	+	o	
Hidrogen	100%	+		
Hidroxid de bariu		+	+	
Hidroxid de calciu		+	+	
I				
Izo-octan	100%	-	-	
L				
Lanolina	100%	+	+	
Lapte		+	+	+
M				
Mercur	100%	+	+	
Metil-amina	max. 32%	+		
Metil-etil cetona	100%	+		

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N				
Naftalina		+	-	-
Nitrobenzen	100%	+	0	
O				
Oxid de etilena	100%	0		
P				
Parafina		+	0	
Peroxid de hidrogen (apa oxigenata)	max. 10%	+		
Petrol (hidrocarburi alifactice)		-	-	-
Piridina	100%	0		
Propan	100%	+		
S				
Suc de fructe		+	+	+
Suc de mere		+		
Sulfat de aluminiu		+	+	
Sulfat de bariu	Sat.	+	+	
Sulfat de calciu		+	+	
Sulfat de cupru	Sat.	+	+	
Sulfat de fier	Sat.	+	+	
Sulfat de magneziu	Sat.	+	+	
T				
Tetraclorura de carbon	100%	-	-	-
Tetrahidrofuran	100%	0	-	-
Tinctura de iod		+		
Toluen	100%	-	-	
Tricloretilena	100%	+	+	
U				
Ulei de masline		+	+	0
Ulei de ricin	100%	+		
Ulei parafinic (FL 65)		+	0	-
Ulei siliconic		+	+	+
Uree		+	+	
Urina		+	+	
W				
White spirit	100%	0	-	
X				
Xilen	100%	-	-	-

DATA SHEET

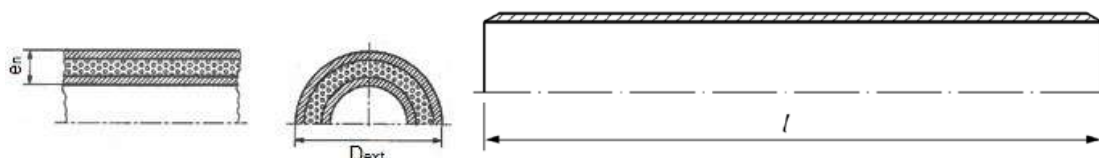
PP-HM MULTILAYER PIPE <KompactKIT> D.110÷400mm SN10

1. Field of use

- Polypropylene PP HM multilayer pipes are used for non-pressure underground sewerage networks without pressure (gravitational sewerage in which the flow is at a free level) for the transport of domestic and meteoric wastewater. The pipes are installed buried in the ground.

2. Technical features

- Reference Standard: SR EN 13476-2 "Plastics piping systems for non-pressure underground drainage and sewerage - structured-wall piping systems of unplasticized poly (vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE). Part 2: Specifications for pipes and fittings with smooth internal and external surface and the system, type A".
- The pipes are manufactured by co-extrusion.
- Materials:
 - the outer and the inner layer are made of polypropylene type PPHM (Polypropylene High Modulus),
 - The intermediate layer is made of polypropylene PP B (Polypropylene block copolymers) with modified minerals.
- Color: the outer and inner layers are orange-brown (RAL 8023) and the intermediate layer is white or black.
- The pipes are chamfered at both ends. PP SN8 S13.3 plugs are used for connection which are delivered together with the pipe.
- The pipes have stiffness class SN8, determined according to ISO 9969, $SN \geq 10 \text{ kN/m}^2$.
- Longitudinal reversion, determined according to EN ISO 2505: max. 2%
- Appearance: when examined with naked eye (no magnifying instruments) surfaces must be smooth, clean, without burrs, pores or other surface defects that can affect the performance of pipes. The ends to be connected must be cut clean and perpendicular to the axis of the pipe.
- Dimensions:



Nominal diameter DN [mm]	Outer diameter Dext. [mm]	e _n minimum [mm]	l [m]	Item
110	110 – 110,3	4,2	6	35059110600
125	125 – 125,3	4,8	6	35059125600
160	160 – 160,5	6,2	6	35059160600
200	200 – 200,5	7,7	6	35059200600
250	250 – 250,5	9,6	6	35059250600
315	315 – 315,6	12,1	6	35059315600
400	400 – 400,7	15,3	6	35059400600

e_n minimum = minimum pipe thickness

l = pipe length.

Marking:

- **Manufacturer's name:** Valrom
- **brand:** KompactKIT
- **MADE IN ROMANIA**
- **Nominal outer diameter:** Ø.... (mm)
- **field of use code:** U
- **stiffness class:** SN10
- **standard:** EN 13476 - 2
- **material:** PP-HM
- **information for traceability:** LOT xxyy (xx - the last two digits of the year, yy - serial number of the lot); date day and month (xx, yy); hour and minute

3. Packing, handling, transport and storage

- For transport of pipes use vehicles with flat surface, without roughness, which will not damage the pipes. Pipes should be supported along their length to avoid damage to the extremities due to vibration.
- When loading and unloading pipes with forklifts care should be taken not to hit the pipes. When handling pipes, it is good to use non-abrasive straps (nylon, hemp or similar). If steel cables are used it is necessary to protect the pipes in the contact area. In cold periods, at freezing temperatures, pipes are prone to damage in case of impact. It is recommended to handle the pipes with maximum attention.
- It is recommended to load the heavier pipes first to avoid deformation of the lighter ones.
- In the long-term (>90days), the storage is done in covered spaces, so that the products are protected from direct solar radiation. In the short term <90 days, storage can be done outdoors.
- Pipes will be stored on flat, stable surfaces, in areas covered and protected against fire, frost, UV radiation and major thermal variations.
- Temporary storage on the site must be made so that the pipes are not damaged, special attention will be paid to keeping the section of the pipe ends intact to not compromise the joint.

- It is recommended that during the cold season, all the pipes should be stored on the supports to avoid freezing.
- Pipes and gaskets shall be kept away from contact with fuels, solvents, oils, greases, paints or heat sources.
- The height of the storage stack will not exceed 1 m regardless of the diameter of the pipe, to avoid deformation of the pipes from the base.
- If the pipes were delivered in the package then the package will be opened only a short time before the installation in the ditch.

4. Warranty and service life:

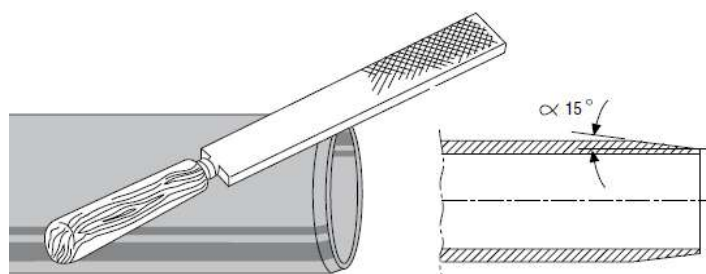
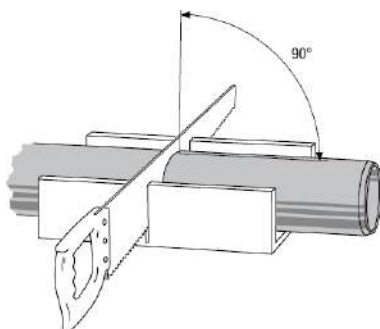
- Service life is 50 years.
- Warranty is 5 years from the date of delivery, provided that the instructions for transport storage, handling and installation are observed.

5. Installation instructions:

- Polypropylene material cannot be glued, so for side joining use mechanical saddle and mechanical couplers <KompactKIT>.
- Assembly stages:
 - Before joining, the elements should be cleaned carefully, they will be checked to be intact.
 - Temporarily remove the seal gasket.
 - Insert pipe spigot into the socket up to the stop and mark the position. The pipe will be withdrawn about 3 mm for each meter of pipe, but not more than 10 mm. The reference line will be marked.
 - Insert the sealing gasket correctly back into the socket.
 - Lubricate interior surface of gasket and exterior surface of pipe spigot with proper lubricant (silicone oil, soap with water etc.). Do not use oil or grease.
 - Push pipe spigot into the socket until the marked line. The success of this operation depends on the exact alignment of the pipes and lubrication.

Cut the pipe with a fine tooth saw .

The cut will be perpendicular on longitudinal pipe axis. Chamfer and bevel the pipe to an angle roughly 15° using a suitable chamfering tool or a fine file.



- PP multilayer pipes belong to the category of flexible pipes. The characteristic of flexible pipes is that under loads they deform significantly without being damaged. To limit the deformation of the pipe, it is very important that the lateral filling is

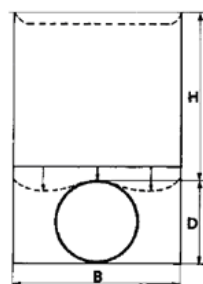
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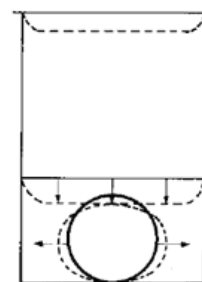
compacted as correctly as possible. The required degree of compaction is established by the project.

- The correct choice of the filling material and the correct execution of the installation are factors that can limit the deformation of the pipe.

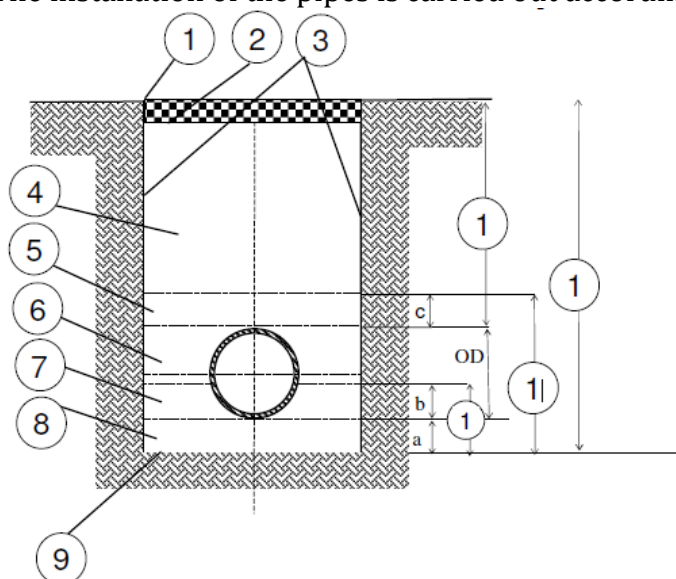
Deformation in the trench of rigid pipes



Deformation in the trench of flexible pipes



The installation of the pipes is carried out according to the provisions of the project.



- 1 surface
- 2 the basis of the road infrastructure
- 3 the walls of the trench
- 4 the actual filling
- 5 the first filling
- 6 lateral filling
- 7 upper bed, b
- 8 bottom bed, a
- 9 trench bottom

- 10 Cover height
- 11 The height of the support
- 12 The height of the special filling
- 13 Trench depth
- a thickness of the lower bed
- b thickness of the upper bed
- c thickness of the first filling
- OD the outside diameter of the pipe

General laying conditions: Multilayer PP-HM pipes are generally installed at depths of at least 1.20 m. In the case where they are laid in areas without traffic, the minimum depth can be reduced to the minimum frost depth.

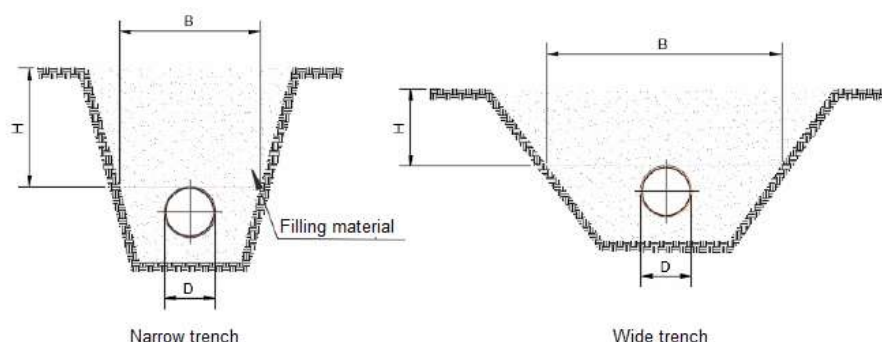
Width of the trench

Trench width is established by the project, it must ensure necessary space for joints inside it and compacting the filling in the pipe area.

Trench width must not exceed the maximum value established by the project.

Classification of the trench:

Type of trench	B	
Narrow trench	$\leq 3 D$	$< H/2$
Wide trench	$> 3 D$ $< 10 D$	$< H/2$
Infinite trench	$\geq 10 D$	$\geq H/2$



Bottom trench

Bottom trench must be dry (without groundwater or meteoric waters), continuous, flat and without stones.

Material and gradient of trench must be in accordance with project specifications. It is recommended not to change the bottom of the trench, if it has been modified, the initial bearing capacity must be restored.

If the trench bottom is unstable or the soil is compressible, appropriate measures should be provided.

In the case of lands with high content of organic substances, unstable (peat or flowing sand) etc., it is necessary to design a support layer on bottom trench. The nature and composition of the support layer are determined by the designer.

In case of frost it is necessary to protect the bottom of the trench so that the frozen layers are not left below or around the pipe.

Bedding

The bedding consists of upper and lower bedding. In the case of the pipe laid on natural trench bottom, the trench bottom is the lower bedding.

The role of the bed is to provide continuous support throughout the entire length of the pipe.

The materials used for embedment shall comply certain requirements in order to be capable of providing permanent stability and load bearing capacity for the pipeline buried in the ground.

Materials used for bedding should contain no particles with size above 20 mm for pipes with $D < 200 \text{ mm}$ and 40 mm for pipes with diameter between 200 and 400 mm.

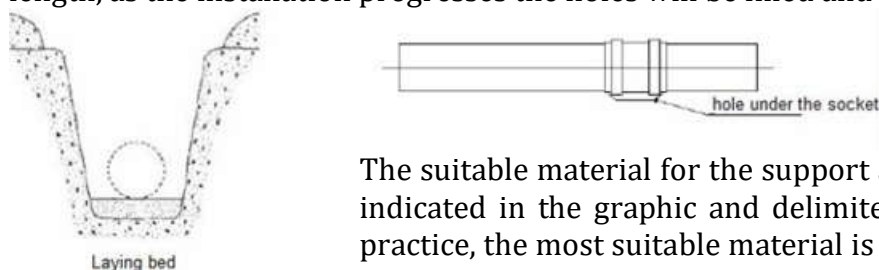
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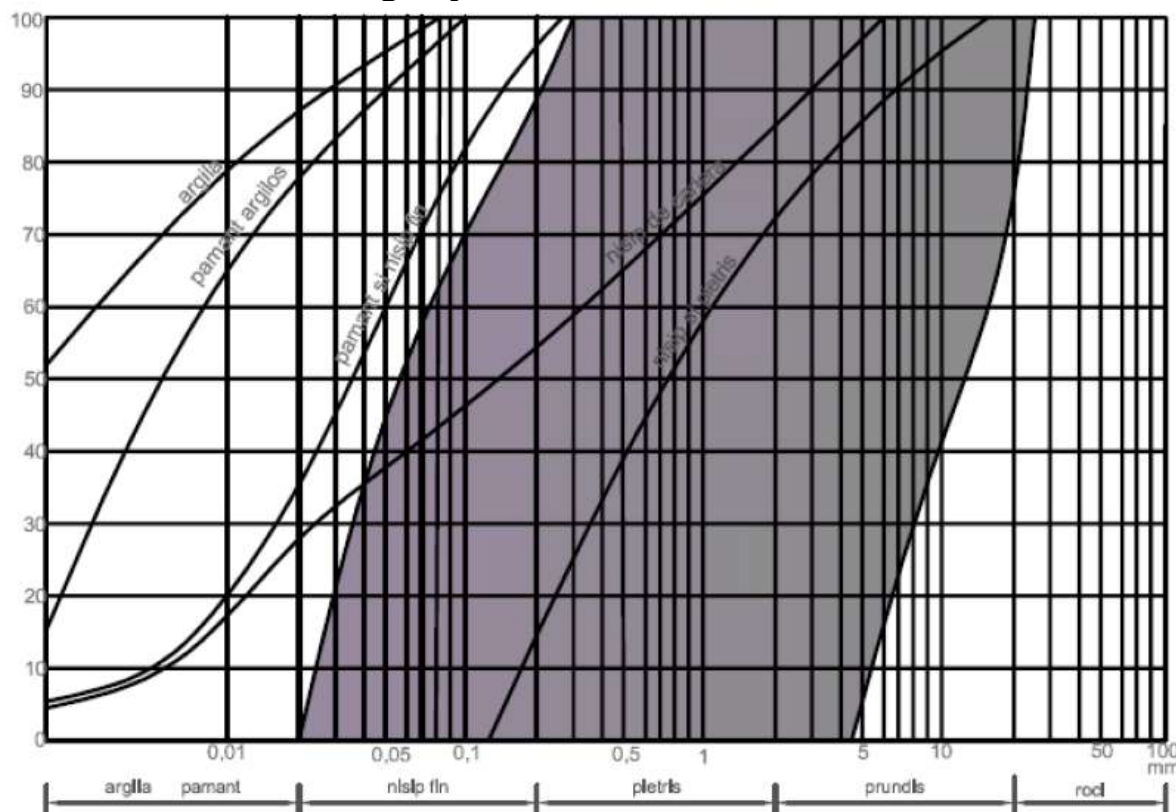
Native soil can be re-used if shall meet all the following requirements: it is permitted by the project; it complies with any compactability requirements in the design; it is free from materials detrimental to the pipe (oversized particle, tree roots, waste, organic material, snow and ice) and any clay larger than 75mm.

The lower bedding layer should generally have a thickness of 10 cm to 15 cm. The bedding material is spread over the entire width of the bottom of the pit and is leveled at the slope of the pipe.

Next to the coupling sockets small holes will be dug, in this way the pipe will rest its entire length, as the installation progresses the holes will be filled and compacted carefully.



The suitable material for the support and for the lateral filling is indicated in the graphic and delimited by the hatched area. In practice, the most suitable material is composed of gravel with a size of 10-15 mm or sand mixed with gravel with a maximum size of 20 mm.

Granulometric curves. Soil groups


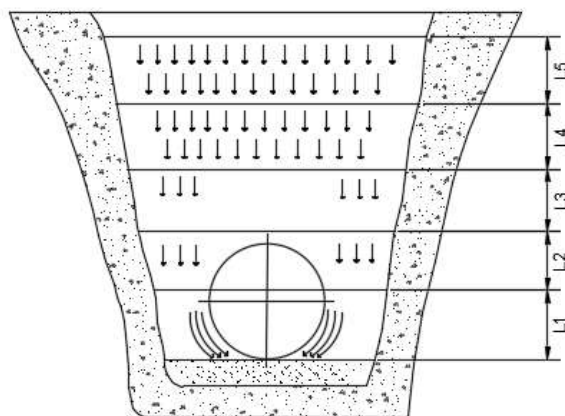
Horizontal: The diameters of the granules that correspond to the inner dimensions of the sieve meshes (mm); **Vertical:** Cumulative weights of the fractions that passed through the sieve, calculated as a percentage of the total weight (%)

Filling procedure

Manual filling in pipe area is the most important because of this depends the formation of the support bed for pipe and behavior in operation at external mechanical demands.

The filling around the pipe and the filling itself must be undertaken only when the state of the support and the connection of the pipes allow to withstand the loads.

The material already used for the construction of the bed will be placed around the pipe and compacted manually (well beaten with rammer and moistened to the limit for maximum tightening), in thin layers (10 cm) to the middle line of the pipe, taking great



care not to remain empty areas under the pipe and that the lateral parts between the pipe and the walls of the excavation are continuous and compact (layer L1).

The second layer of the side L2 will reach the upper generator of the pipe. Filling and compaction should be performed simultaneously on both sides of the pipe to prevent unwanted movement of the pipe.

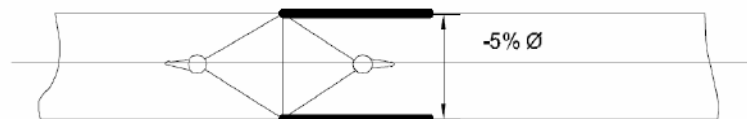
The third layer L3, will reach a higher dimension by 15 cm than the upper generator of pipe.

In layer L3 the compaction should be applied to the pipe only laterally and not above it. The subsequent filling (layers L4 and L5) will be carried out with the help of the earth that comes from the excavation cleaned of elements with a larger dimension > 100 mm, of roots, waste, organic materials, snow, ice or clay bulges larger than 75 mm. In areas where no compaction is required, elements with a maximum size of up to 300 mm are accepted if the ridge of the pipe has been covered.

The resulting Proctor index must be higher than the level provided by the designer. The compaction technology is performed in accordance with the calculations for checking the resistance of the pipe to earth loads and other demands. The last layer that sits is the vegetable layer.

Checking the diameter deformation

The vertical variation of the inner diameter of the pipes should be inspected, in order to verify the conformity with the mechanical resistance calculation. In general the maximum deformation of the pipe must not exceed 5 - 6%. This limit value is imposed due to network exploitation considerations. The verification can be carried out with the help of mechanical instruments (sphere or double cone) or with the help of optical instruments (cameras). From the reception procedure are excluded, due to the difficulties of implementation, the parts of the pipe that include special parts.



In cases where there are higher values of deformation than those established above, it is necessary to examine the cause.

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Tightness test

It is carried out according to the prescriptions of the project and the national provisions in force:

NP 133 Normative regarding the design, execution and exploitation of the water supply and sewage systems of localities.

STAS 3051-91: Sewage systems. Channels of external sewerage networks. Fundamental design requirements

Testing of pipes in sewerage networks, according to NP 133:

The tightness test of the sewerage networks is carried out according to the provisions of STAS 3051. The tightness test is carried out on sections of maximum 500 m.

Before must be done:

- a) partial fillings leaving the joints free
- b) tight closures for all openings
- c) blocking of extremities and points susceptible to movement during the test.

OBSERVATIONS:

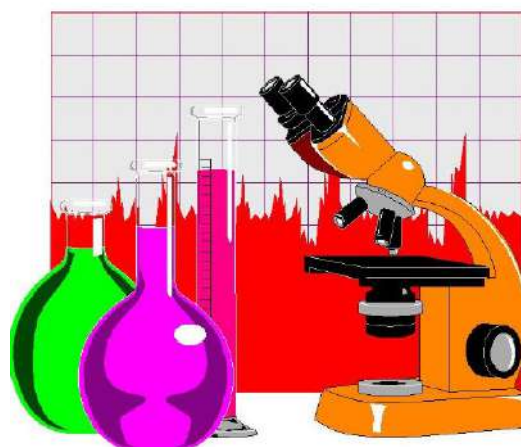
- According to EN 13476, PVC fittings with resistance class SDR 41 (according to EN 1401-1) and PP fittings with resistance class S16 (comp. EN 1852-1) can be used with pipes with ring stiffness SN4 or SN8.
- If it is desired to use PP multilayer pipes with chemically contaminated waste water (e.g. industrial water), the chemical resistance of the pipes must be evaluated in the design (see Appendix: Chemical resistance of polypropylene) and the use temperature must be taken into account.
- To evaluate the behavior of the sealing gasket, the document ISO/TR7620 *Chemical resistance for rubber materials should be consulted.*

ANNEX THE CHEMICAL RESISTANCE OF POLYPROPYLENE

Chemical resistance of polypropylene as it is specified in the document ISO/TR 10358:1993 Plastics pipes and fittings - Combined chemical-resistance classification table.

The information represents a summary of the data regarding the chemical resistance of polypropylene PP, presented in different public sources, derived both from practical experience and from laboratory tests.

The evaluation was done by immersing a material sample in the respective fluid at 20°, 60° and 100°C, at atmospheric pressure - in the absence of internal pressure and other external mechanical stresses - followed by the determination of the traction characteristics.

**Notes:**

1. In the tables, the concentrations of the solutions are expressed by mass.

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2. The information provided in this technical bulletin refers only to chemical resistance. Because generally other factors are involved, such as permeability, product geometry, etc. it is recommended to test the compatibility of the material for each individual use.

Definitions, symbols and classifications:

• **chemical resistance:** the ability of a material (plastic) to resist (modify the initial characteristics at a minimal level) after exposure to a fluid or direct contact with a certain substance (such as acids, bases, oils, fats, etc.) ; chemical resistance is assessed by determining some mechanical characteristics determining the conditions of use: loss of mass, degree of swelling, tensile stress-deformation characteristics, etc.

• **resistant: +**

the material is not affected or the effect is minor and difficult to quantify; stable in the long term.

• **limited resistance: o**

the environment may swell the PP or induce limited chemical changes. The use is restricted in terms of pressure and temperature and the shortening of the service life must be taken into account.

• **not recommended: -**

the effect produced is severe and the use of PP in contact with this fluid is **NOT** recommended

• **Sat.:** saturated aqueous solution, obtained at 20°C

• **Soil:** aqueous solution at a concentration of $\geq 10\%$ but unsaturated

• **Soil. dil:** diluted solution at a concentration $\leq 10\%$

• **Soil. ind.:** aqueous solution at the usual concentration for industrial use

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BULETIN TEHNIC TC003 – Rezistența chimică a polipropilenei

4. Rezistența chimică

Denumire	Condiții	Temperatură, °C		
		20	60	100
A				
Acid azotic	60%	+	-	
Acetat de butil	100%	+	o	o
Acetat de etil	100%	o	o	
Acetat de metil	100%	+	+	
Acetat de pentil	100%	o		
Acetat de plumb	Sat.	+	+	
Acetofenona	100%	o	o	
Acetona	100%	+	+	
Acid acetic	max. 40%	+	+	
Acid acetic	50%	+	+	
Acid acetic	10%	+	+	
Acid acetic	97%	+	o	
Acid azotic	fumans	-	-	
Acid azotic	70%	-	-	
Acid benzoic		+	+	
Acid boric		+	+	
Acid carbonic		+	+	
Acid citric	10%	+	+	
Acid cloracetic	Sat.	+		
Acid clorsulfonic	100%	-	-	-
Acid formic	100%	+		
Acid fosforic	95%	+	+	
Acid hidroxi-acetic	30%	+		
Acid lactic	max. 90%	+	+	
Acid oleic	100%	+	o	
Acid oxalic				
Acid sulfuric	max. 10%	+	+	+
Acid sulfuric	50%	+	o	o
Acid sulfuric	96%	+	o	-
Acid tanic	10%	+	+	
Acid tartric		+	+	
Acid trichloracetic	10%	+	+	
Acizi grasi (C6)	100%	+	+	
Alcool benzoic	Sat.	+	+	
Alcool etilic	max. 95%	+	+	+
Alcool izopropilic	100%	+	+	+
Alcool metilic	5%	+	o	o
Amoniac (sol apoasa)	max. 30%	+		
Anilina	100%	+	+	
Apa de mare		+	+	+
Apa distilata	100%	+	+	+
Apa regala		o	o	
Azotat de calciu		+	+	
Azotat de cupru	Sat.	+	+	
Azotat de fier	Sat.	+	+	
Azotat de magneziu	Sat.	+	+	
B				
Benzen	100%	o	-	-
Benzina		-	-	-
Borax	Sol.	+	+	
Butanol	100%	+	o	o
Butil glicol	100%	+		
C				
Carbonat de bariu	Sat.	+	+	
Carbonat de calciu	Sat.	+	+	+
Carbonat de magneziu	Sat.	+	+	
Carbonat de sodiu	max. 50%	+	+	o
Cerneala		+	+	
Cetone		+		
Cianura de cupru	Sat.	+	+	
Ciclohexan	100%	+		
Ciclohexanol	100%	+	o	
Ciclohexanona	100%	o	-	-

Denumire	Condiții	Temperatură, °C		
		20	60	100
Clor (lichid)	100%	-	-	-
Clor (sol apoasa)	Sat.	+	o	
Clorbenzen	100%	-	-	
Cloretanol	100%	+		
Cloroform	100%	o	-	-
Clorura de aluminiu		+	+	
Clorura de amoniu	Sat.	+		
Clorura de bariu	Sat.	+	+	
Clorura de calciu	Sat.	+	+	+
Clorura de cupru	Sat.	+	+	
Clorura de etil	100%	-	-	
Clorura de fier	Sat.	+	+	
Clorura de magneziu	Sat.	+	+	
Clorura de nichel	Sat.	+	+	
Clorura de sodiu	20%	+	o	-
Combustibil aviatie (115/145 octan)		o	-	
Crezol	peste 90%	+		
D				
Decalina (decahidronaftalena)	100%	-	-	-
Detergenti	2%	+	+	+
Dibutilftalat	100%	+	o	-
Dicloretilena	100%	+		
di-etanol amina	100%	+		
di-etilen glicol	100%	+	+	
Diizooctil-ftalat	100%	+	+	
di-metil amina	100%	+		
di-metil formamida	100%	+	+	
Dioxan	100%	o	o	
Dioxid de sulf (umed sau uscat)	100%	+	+	
Disulfura de carbon	100%	o	-	
E				
Emulsifianti		+	+	
Emulsii acrilice		+	+	
Etanolamina	100%	+	+	
Eter izopropilic	100%	+	+	+
Etilenglicol	100%	+	+	+
F				
Fenol	5%	+	+	
Fenol	90%	+		
Formaldehida	40%	+		
Fosfat de calciu	50%	+		
Furfurol	100%	-	-	
G				
Glicerina	100%	+	+	+
Glicol		+	+	
H				
Heptan	100%	o	-	-
Hexan	100%	+	o	
Hidrogen	100%	+		
Hidroxid de bariu		+	+	
Hidroxid de calciu		+	+	
I				
Izo-octan	100%	-	-	
L				
Lanolina	100%	+	+	
Lapte		+	+	+
M				
Mercur	100%	+	+	
Metil-amina	max. 32%	+		
Metil-etil cetona	100%	+		

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N				
Naftalina		+	-	-
Nitrobenzen	100%	+	0	
O				
Oxid de etilena	100%	0		
P				
Parafina		+	0	
Peroxid de hidrogen (apa oxigenata)	max. 10%	+		
Petrol (hidrocarburi alifactice)		-	-	-
Piridina	100%	0		
Propan	100%	+		
S				
Suc de fructe		+	+	+
Suc de mere		+		
Sulfat de aluminiu		+	+	
Sulfat de bariu	Sat.	+	+	
Sulfat de calciu		+	+	
Sulfat de cupru	Sat.	+	+	
Sulfat de fier	Sat.	+	+	
Sulfat de magneziu	Sat.	+	+	
T				
Tetraclorura de carbon	100%	-	-	-
Tetrahidrofuran	100%	0	-	-
Tinctura de iod		+		
Toluen	100%	-	-	
Tricloretilena	100%	+	+	
U				
Ulei de masline		+	+	0
Ulei de ricin	100%	+		
Ulei parafinic (FL 65)		+	0	-
Ulei siliconic		+	+	+
Uree		+	+	
Urina		+	+	
W				
White spirit	100%	0	-	
X				
Xilen	100%	-	-	-

SEWER MANHOLES AND INSPECTION CHAMBERS

DIAMIR

RELIABLE COMPONENTS
OF SEWER AND DRAINAGE SYSTEMS



ENVIRONMENTAL FRIENDLY SOLUTIONS

ISO 14001

ISO 9001





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Intended use

DIAMIR manholes are intended for construction of gravitational sewer systems (sanitary, storm-water, combined, industrial sewage systems) and drainage.

The offer includes the following manhole types:

- non-entry inspection chambers, allowing for access to the storm water or sanitary sewage systems with inspection or cleaning devices,
- entry manholes (inspection manholes) enabling staff to have access to storm-water or sanitary sewage systems
- catch basins with sumps are used in storm-water drainage systems. If “blind” base units are applied, chambers are used as, e.g., tanks, sewage pumping stations or wells.

Standards, approvals

PN-EN 13598-2:2009 Plastics piping systems for non-pressure underground drainage and sewerage - Unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE) - Part 2: Specifications for manholes and inspection chambers in traffic areas and deep underground installations

PN-EN 124:2000 Gully tops and manhole tops for vehicular and pedestrian areas – Design requirements, type testing, marking, quality control

PN-EN 476:2011 General requirements for components used in drains and sewers

PN-EN 681-1 :2002 Elastomeric seals. material requirements for pipe joint seals used in water and drainage applications — Part 1 : Rubber

Technical Approval **AT/2010-02-0830** “DIAMIR” Manholes and inspection chambers made of polypropylene (PP), poly(vinyl chloride)(PCV) and polyethylene (PE) issued by the Road and Bridge Research Institute in Warsaw

Technical Approval **AT/07-2011-0242-00** „DIAMIR” Manholes and inspection chambers made of polypropylene (PP), poly(vinyl chloride)(PCV) and polyethylene (PE) issued by the Railway Institute in Warsaw

Technical Approval **AT/2011-02-2706** Reinforced concrete tops for plastic gullies and manholes issued by the Road and Bridge Research Institute in Warsaw

Production technology

DIAMIR manhole base units are manufactured of polypropylene (PP) with the injection method. The method ensures very high accuracy and repeatability of the production process. Riser pipes and telescope pipes are manufactured of polypropylene (PP) and polyvinyl chloride (PVC) with the method of extrusion.

Resistance

Polypropylene is material of exceptional resistance to chemical substances, strokes, very low and high temperatures and stress corrosion. The maximum temperature of flowing sewage for PP base units equals 95 °C, and the minimum ambient temperature during installation of manhole components made of PP is – 20 °C. Manhole/inspection chamber components made of PVC should not be assembled at temperature below zero. All manhole elements made of PP or PVC and elastomeric gaskets are resistant to domestic sewage and storm water. However, if industrial sewage is involved, its chemical composition, concentration and temperature should be analysed. Resistance of PP and PVC is specified in the ISO/TR 10358 guidelines, whereas resistance of elastomeric seals – in ISO/TR 7620. In case of any doubts please do not hesitate to consult our technical advisor.

Merits

Use of **DIAMIR** manholes ensures:

- cost savings resulting from low weight of individual chamber components, which makes it possible to reduce to the minimum use of heavy equipment and construction of access roads,
- total tightness against infiltration of groundwater and extrafiltration of sewage into the ground which might contaminate the environment



- excellent hydraulic properties, low sewage flow resistance and no pollutants sedimentation in the base unit,

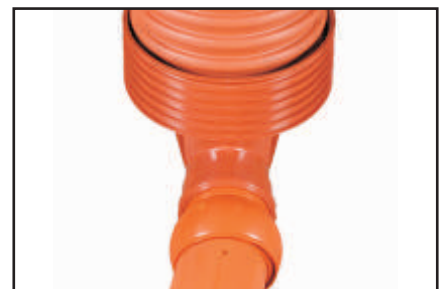
- high durability, inspection and cleaning are easy thanks to the optimised manhole design
- high resistance to ground water uplift pressure and adaptation to variable climatic conditions thanks to fins on manhole components,
- speedy and easy assembly thanks to push-on pipe joints with gaskets



- a potential for attaining essentially any height up to 6 meters and the telescopic top section of a chamber makes it possible to adjust accurately its height matching the pavement level,

- a wide range of base units makes design and construction easier and use of ball-and-socket joints in connection hubs makes it possible to change pipeline direction by $\pm 7,5^\circ$ and to connect a manhole to a steep sewer,

- at least 100 – year lifetime thanks to the application of cutting edge technologies, plastics resistant to abrasion, aggressive sewage as well as high impact resistance and elongation at break.



Quality control

All the types of the offered manholes/chambers are subjected to laboratory and field tests for durability, tightness and resistance to static and dynamic loads. The management system based on EN ISO 9001 implemented in Barbara Kaczmarek enterprise ensures rigorous supervision over quality of our products.



Selection of a top

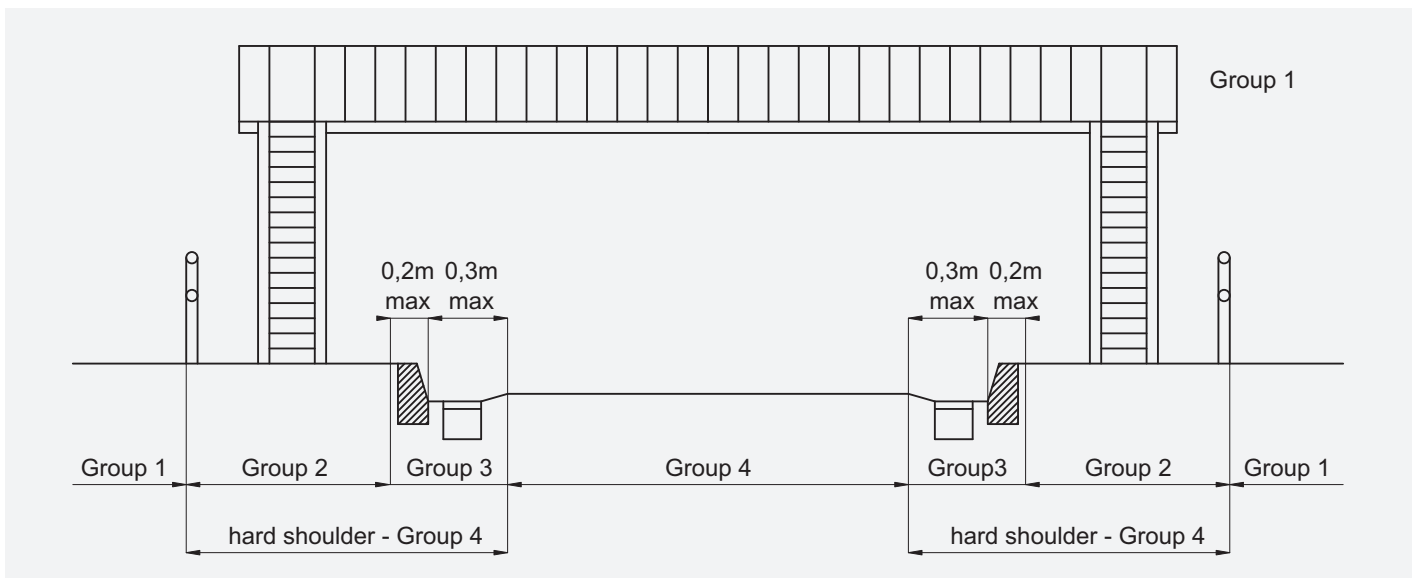
Location of a manhole affects a choice of an appropriate gully or manhole top adapted to the local load conditions. A top class should be specified in a technical design. For DIAMIR manholes/chambers, tops of A, B, C, and D classes (according to EN 124:2000) are used in road ROWs. In green areas, where small loads occur, unclassified tops may be applied.

Group 1 (min. Class A15) Areas intended solely for pedestrians and pedal cyclists;

Group 2 (min. Class B125) Roads and areas for pedestrians, and comparable areas, parking lots or places where cars are parked;

Group 3 (min. Class C250) Applies solely do sewer gully tops installed in the area of kerbside channels of roads, which extends a maximum of 0,5 m into a carriageway and a maximum of 0,2 m into the footway when measured from the kerb edge;

Group 4 (min. Class D400) Carriageways of roads (including pedestrian streets) hard shoulders, and parking areas for all types of road vehicles



Classification

Our company offers five state-of-the-art manhole systems called DIAMIR. The number after the name stands for a diameter of a riser pipe or a chamber of modular sections.

The systems offered include the following:

DIAMIR 315

DIAMIR 400

DIAMIR 425

DIAMIR 600

DIAMIR 1000

Technical features

Non-entry inspection chambers **DIAMIR 315**

Main components of a chamber:

-**base unit, a base of an inspection chamber**, allowing for direct connection of storm water drainage or sanitary sewer systems installed in the ground, including incorporated channels with possible branches

-**a riser pipe** of internal diameter equalling 315

-**a telescope section**, allowing for compensation of settlement which may take place after installation and making it possible to adjust the chamber height. A telescope pipe is installed to the depth of 0,8 m below the ground level.



Standards:

-DIAMIR 315 inspection chamber is compliant with

EN 13598-2:2009

EN 476:2011

-approval for use in road ROWs

Technical Approval **IBDiM AT/2010-02-0830**

Technical Approval **IK AT/07-2011-0242-00**

Technical Approval **IBDiM AT/2011-02-2706**

-GIG (Central Mining Institute) Opinion approving their use in the areas of mining damages up to the 4th category;

-Resistance of PP chamber components to chemical substances is compliant with the guidelines issued by

ISO/TR 10358

-Gully tops and manhole tops meet the requirements of standard

EN 124:2000

-Seals meet the requirements of standard

EN 681-1:2002

-Chemical resistance of elastomeric seals to chemical substances is compliant with the requirements of the

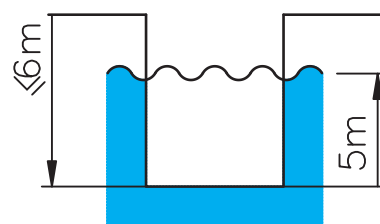
ISO/TR 7620 Guidelines

Usage:

-maximum installation depth 6 m

-acceptable ground water table 5 m

-acceptable load caused by traffic SLW60 according to ATV-A127P



Technical features

Technical data

Base units are made of polypropylene (PP), with reinforcing ribs. They are adapted to connection with vertical riser pipes. There is a horizontal channel in the base unit with one or a few inlet connector pipes and one outlet connector pipe ending with hubs for connection with plain wall pipes made of PVC-U, PP or PE.



Type 1	Type 2			Type 3		Type 4	
DN	DN 1	DN	DN 1	DN 1	DN	DN	DN 1
110	110	110	110	110	110	110	110
160	160	160	160	160	160	160	160
200	200	200	200	200	200	200	200

A ball-and-socket joints $\pm 7,5^\circ$ may be used in connection bells 160, 200 (page 28)

Height adjustment

Non-entry inspection chambers **DIAMIR 315**

Specifications and height adjustment

In specifications for materials required for an investment total numbers of individual inspection chamber components should be indicated:

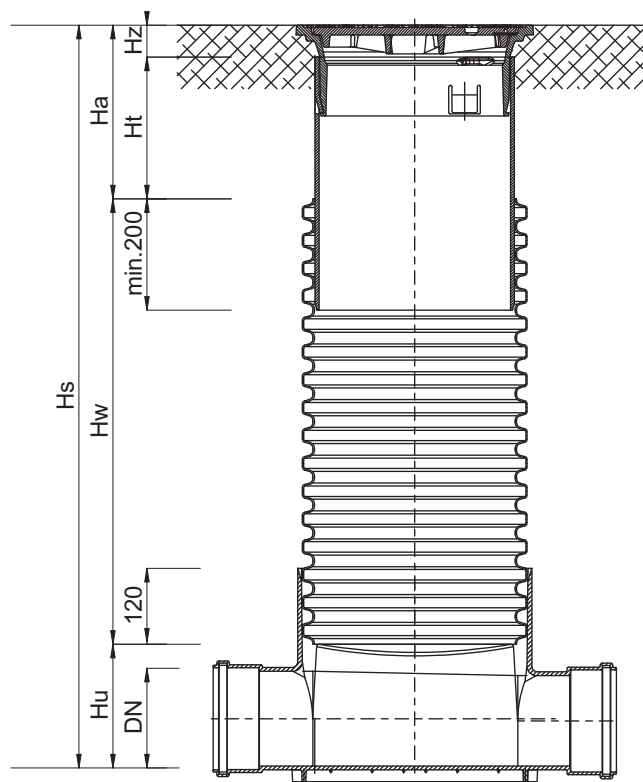
- base units
- riser pipes
- tops

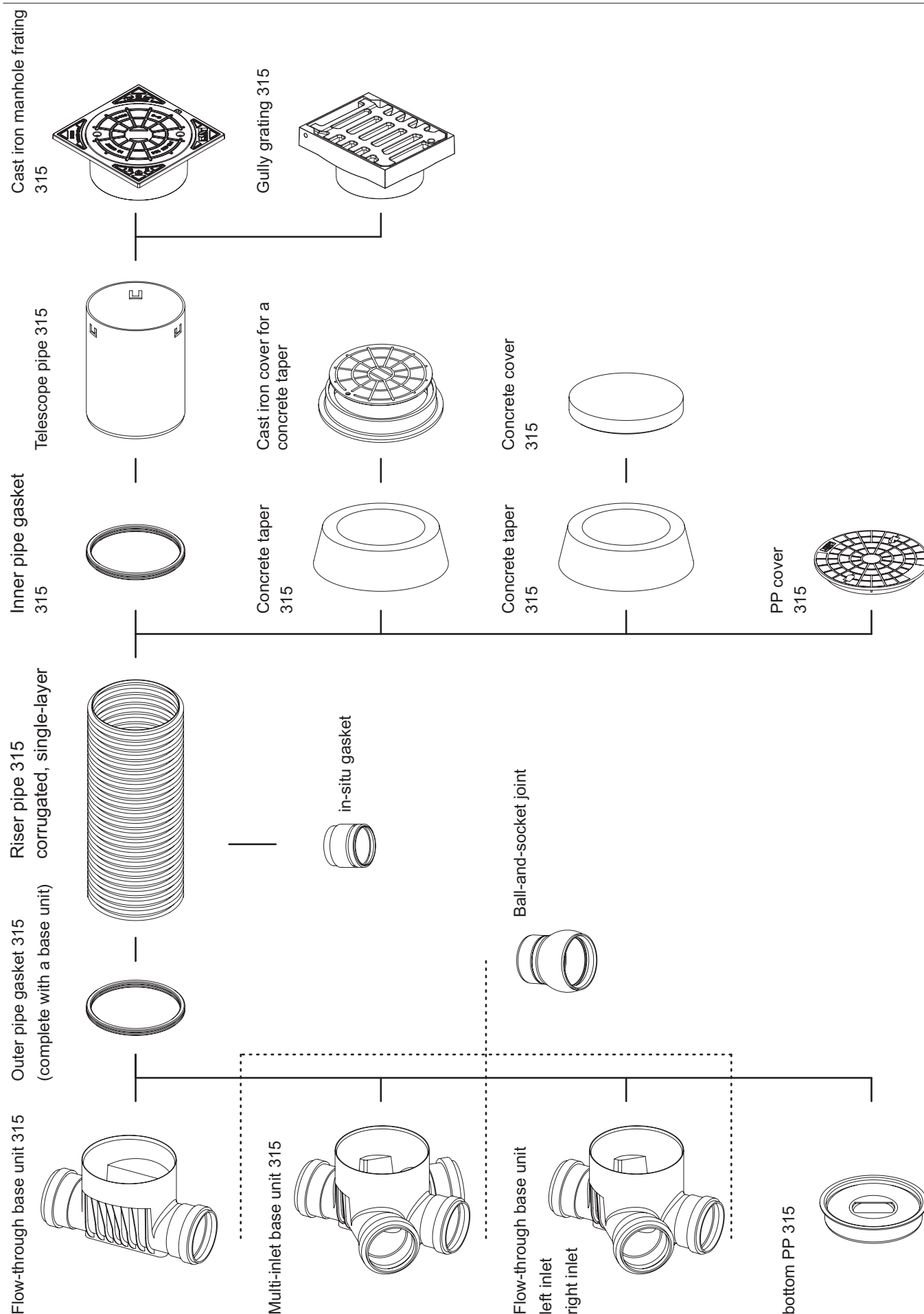
The input parameter is chamber height specified in the design – the difference between the ground level and the chamber invert (base unit level). We label it as **Hs**. In order to make calculations easier, there is effective height (**Hu**) specified for each base unit type, that is, the distance between the bottom of a base unit and the bottom of base unit bell in which a riser pipe is installed.

For calculations, we label the height of a riser pipe as **Hw**. The effective height of a top section (telescope) will be **Ha**. One should bear in mind that the effective height of the telescope must not be smaller than thickness of the structural pavement layer. Height of a non-entry inspection chamber **DIAMIR 315**

$$H_s = H_u + H_w + H_a$$

$$H_a = H_t + H_z$$

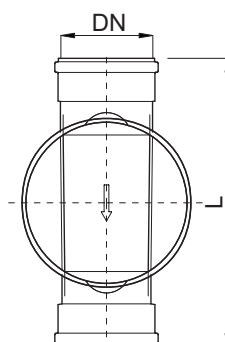
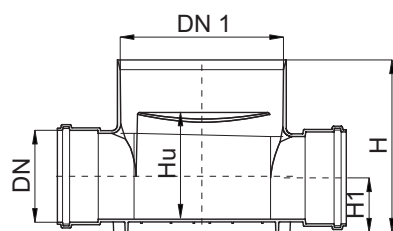




Flow-through base unit

with a gasket

Type 1

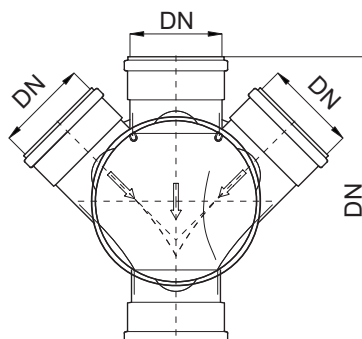
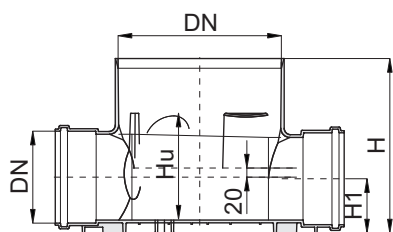


DN [mm]	DN 1 [mm]	H [mm]	Hu [mm]	H1 [mm]	L [mm]	Weight [kg]	index -
110	355	282	145	68	564	2,9	2531110300
160	355	337	192	100	636	3,6	2531120300
200	355	382	234	122	632	4,1	2531130300

Kineta zbiorcza 315

with a gasket

Type 2

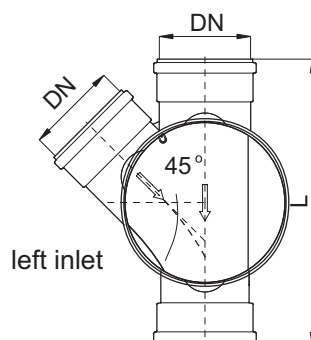
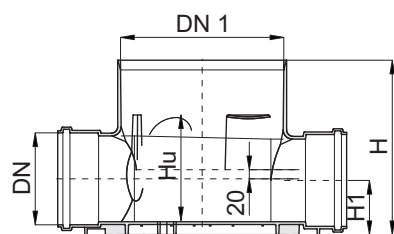


DN [mm]	DN 1 [mm]	H [mm]	Hu [mm]	H1 [mm]	L [mm]	Weight [kg]	index -
110	355	282	148	68	564	3,3	2532110300
160	355	337	192	100	636	4,4	2532120300
200	355	377	234	122	632	5,3	2532130300

Flow-through base unit 315

with a gasket
with left inlet

Type 3

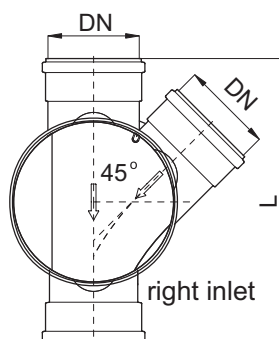
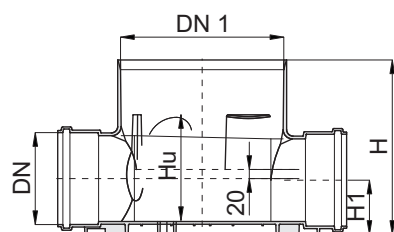


DN [mm]	DN 1 [mm]	H [mm]	Hu [mm]	H1 [mm]	L [mm]	Weight [kg]	index -
110	355	282	145	68	564	3,1	2533113300
160	355	337	192	100	636	4,0	2533123300
200	355	382	234	122	632	4,5	2533133300

Flow-through base unit 315

with a gasket
with right inlet

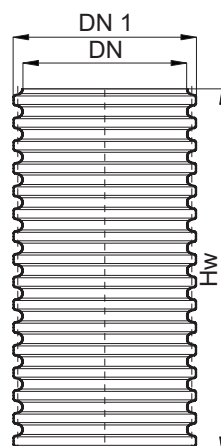
Type 4



DN [mm]	DN 1 [mm]	H [mm]	Hu [mm]	H1 [mm]	L [mm]	Weight [kg]	index -
110	355	282	145	68	564	3,1	2534113300
160	355	337	192	100	636	4,0	2534123300
200	355	382	234	122	632	4,5	2534133300

Riser pipe 315

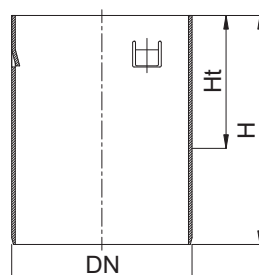
corrugated, single-layer
SN 4



DN [mm]	DN 1 [mm]	Hw [mm]	Weight [kg]	index -
315	355	1000	4,0	2713312100
315	355	2000	8,0	2713312200
315	355	3000	12,0	2713312300
315	355	6000	24,0	2713312600

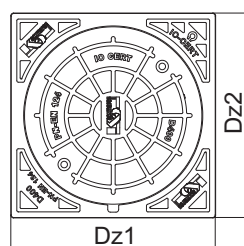
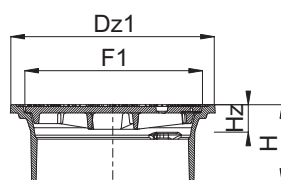
Telescope pipe 315

for cast iron chamber cover 315



DN [mm]	H [mm]	Ht [mm]	Weight [kg]	index -
315	400	200	3,7	2781321040
315	800	600	7,4	2781321080

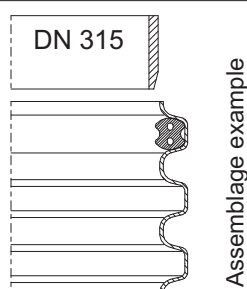
Cast iron chamber cover 315



	Dz1 [mm]	Dz2 [mm]	F1 [mm]	H [mm]	Hz [mm]	Weight [kg]	index -
A15	375	375	320	143	50	20,5	2901131100
B125	375	375	320	143	50	22,9	2901132100
B125 K	375	375	320	143	50	22,3	2902132100
D400	375	375	320	143	50	31,5	2901134100
D400 K	420	340	395/320	150	60	40,0	2902134100

Corrugated pipe gasket 315

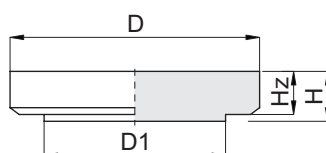
all-purpose



DN [mm]	B [mm]	Weight [kg]	index -
315	20	0,3	5162131050

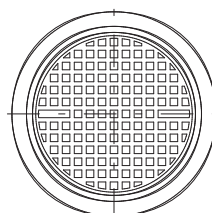
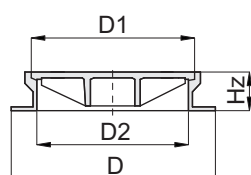
a gasket installed outside or inside a riser pipe groove

Concrete cover 315



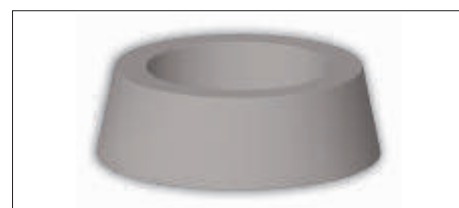
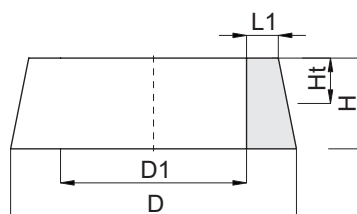
	DN [mm]	D [mm]	D1 [mm]	H [mm]	Hz [mm]	Weight [kg]	index -
A15	315	510	355	110	95	51,3	2952131000

Cast iron chamber cover 315



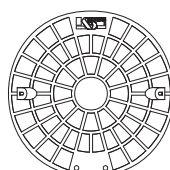
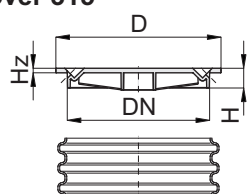
	DN [mm]	D [mm]	D1 [mm]	D2 [mm]	Hz [mm]	Weight [kg]	index -
B125	315	450	375	325	70	26,0	2901142500

Concrete taper 315



	DN [mm]	D [mm]	D1 [mm]	L1 [mm]	H [mm]	Ht [mm]	Weight [kg]	index -
B125	315	565	365	70	220	110	65,6	2951132000

PP Cover 315



	DN [mm]	D [mm]	H [mm]	Hz [mm]	Weight [kg]	index -
A15	315	364	110	95	1,3	2539405090

Technical features

Technical features

Non-entry inspection chambers **DIAMIR 400**

Main components of a chamber

- a **base unit, a base of an inspection chamber**, allowing for direct connection of storm water drainage or sanitary sewer systems installed in the ground, including incorporated channels with possible branches
- a **riser pipe** of external diameter equalling 400
- a **telescope section**, allowing for compensation of settlement which may take place after installation and making it possible to adjust the chamber height. A telescope pipe is installed to the depth of 0,8 m below the ground level.



Standards:

- DIAMIR 400 inspection chamber is compliant with

EN 13598-2:2009

EN 476:2011

- approval for use in road ROWs

Technical Approval **IBDiM AT/2010-02-0830**

Technical Approval **IK AT/07-2011-0242-00**

Technical Approval **IBDiM AT/2011-02-2706**

- GIG (Central Mining Institute) Opinion approving their use in the areas of mining damages up to the 4th category;

- Resistance of PP chamber components to chemical substances is compliant with the guidelines issued by

ISO/TR 10358

- Gully tops and manhole tops meet the requirements of standard

EN 124:2000

- Seals meet the requirements of standard

EN 681-1:2002

- Chemical resistance of elastomeric seals to chemical substances is compliant with the requirements of the

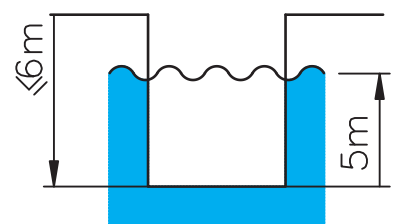
ISO/TR 7620 Guidelines

Usage:

- maximum installation depth 6 m

- acceptable ground water table 5 m

- acceptable load caused by traffic SLW60 according to ATV-A127P



Technical features

Technical data

Base units are manufactured of polypropylene, with reinforcing ribs. They are adapted to connection with vertical riser pipes. There is a horizontal channel in the base unit with one or a few inlet connector pipes and one outlet connector pipe ending with hubs for connection with plain wall pipes made of PVC-U, PP or PE or connector pipes adapted to connection with structural pipes K2-KAN.



Type 1	Type 2		Type 3		Type 4	
DN	DN 1	DN	DN 1	DN 1	DN	DN 1
110	110	110	110	110	110	110
160	160	160	160	160	160	160
200	200	200	200	200	200	200
250	250	250	250	250	250	250
315	315	315	315	315	315	315
400	200-315	400	200-315	400	400	200-315
200K2-Kan	200K2-Kan	200K2-Kan	200K2-Kan	200K2-Kan	200K2-Kan	200K2-Kan
250K2-Kan	250K2-Kan	250K2-Kan	250K2-Kan	250K2-Kan	250K2-Kan	250K2-Kan
300K2-Kan	300K2-Kan	300K2-Kan	300K2-Kan	300K2-Kan	300K2-Kan	300K2-Kan
400K2-Kan	200-300	400K2-Kan	200-300	400K2-Kan	400K2-Kan	200-300

A ball-and-socket joints $\pm 7,5^\circ$ may be used in connection bells 160, 200, 250, 315 (page 28)

Height adjustment

Non-entry inspection chambers **DIAMIR 400**

Specifications and height adjustment

Preparing specifications for materials required for an investment, total numbers of individual inspection chamber components should be indicated:

-base units, -riser pipes, -tops

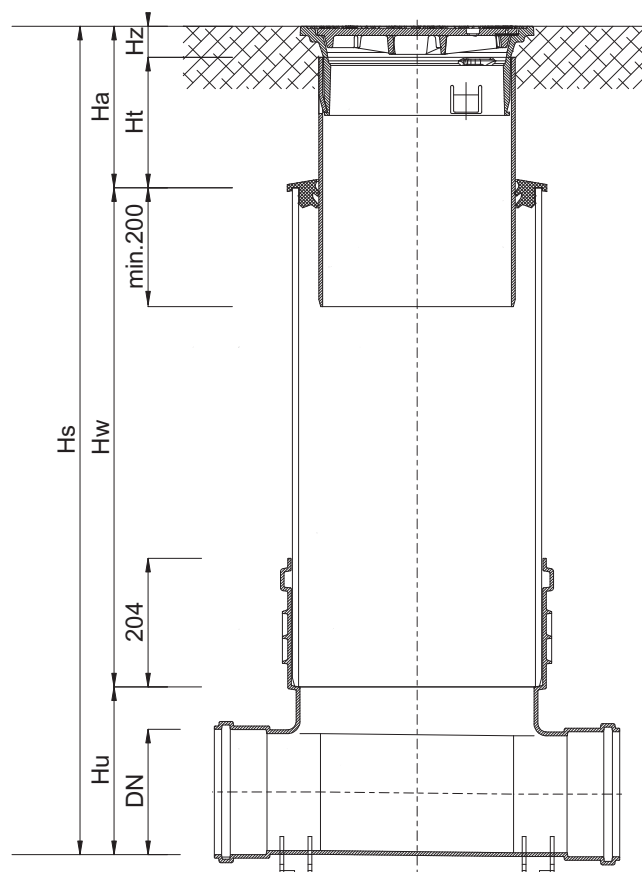
The input parameter is chamber height specified in the design – the distance between the ground level and the chamber invert (base unit level). We label it as **Hs**. In order to make calculations easier, there is effective height (**Hu**) specified for each base unit type, that is, the distance between the bottom of a base unit and the bottom of base unit bell in which a riser pipe is installed.

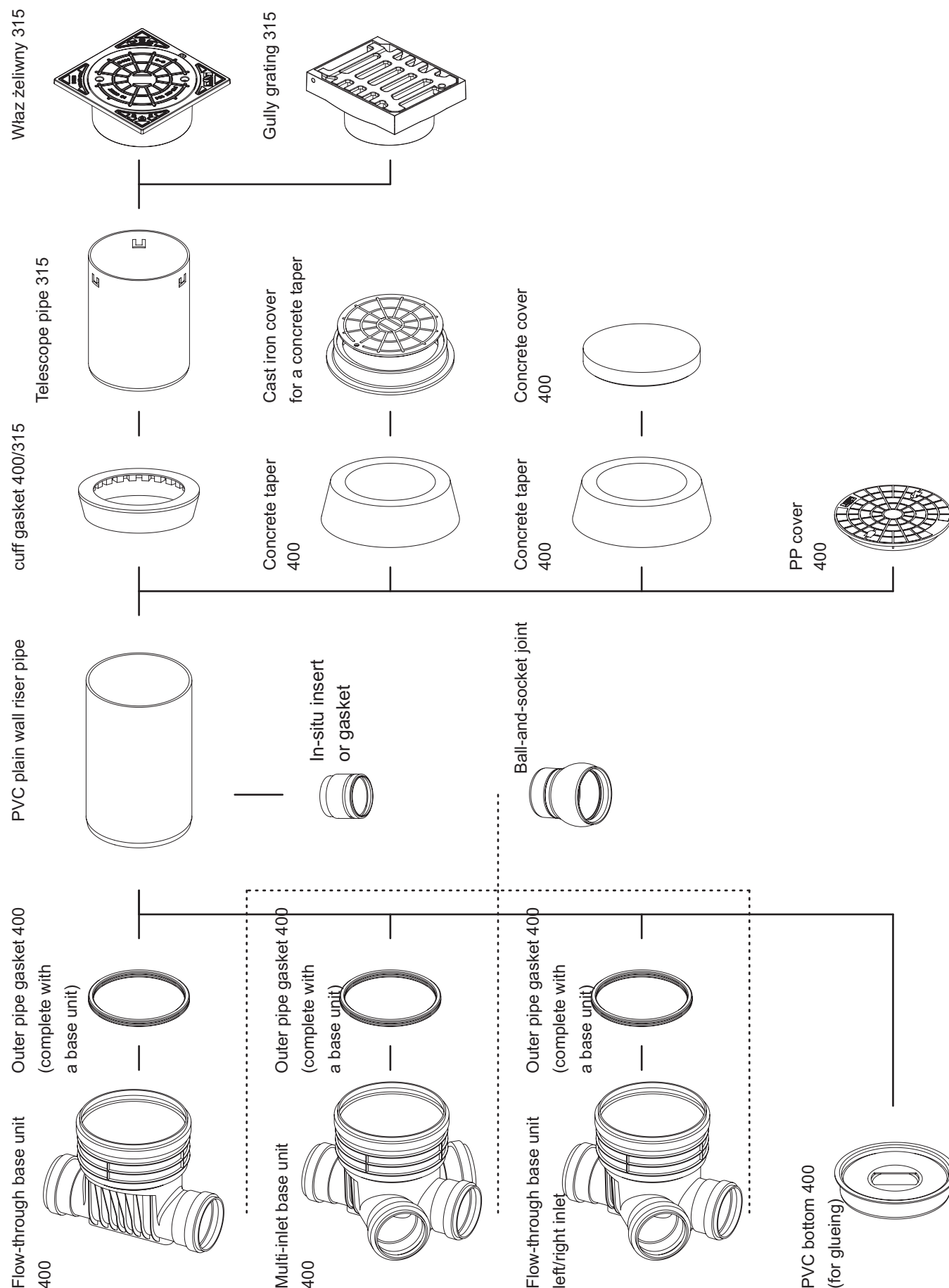
For calculations, we label the height of a riser pipe as **Hw**. The effective height of a top section (telescope) will be **Ha**. One should bear in mind that the useful height of the telescope must not be smaller than thickness of the structural pavement layer.

Height of a non-entry inspection chamber **DIAMIR 400**

$$H_s = H_u + H_w + H_a$$

$$H_a = H_t + H_z$$

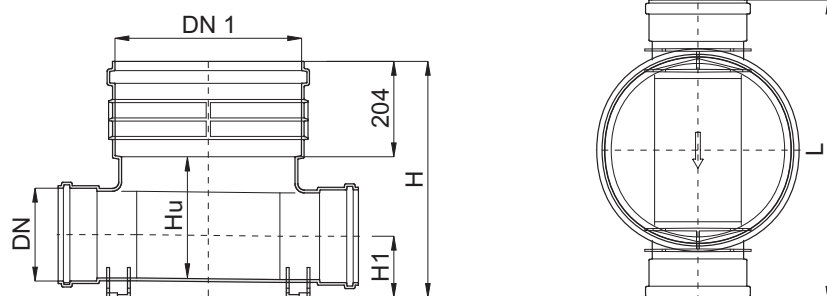




Flow-through base unit 400

with a gasket

Type 1



DN [mm]	DN 1 [mm]	H [mm]	Hu [mm]	H1 [mm]	L [mm]	Weight [kg]	index -
110	400	400	180	68	564	4,2	2541110300
160	400	492	244	116	622	4,0	2541120300
200	400	511	263	136	650	4,7	2541130300
250	400	714	455	168	1154	14,2	2541140300
315 **	400	714	455	198	1072	13,7	2541150300
400 **	400	714	455	238	1076	14,8	2541160300
200 K2 *	400	511	263	136	680	4,7	2541530300
250 K2 *	400	714	455	174	1074	14,1	2541540300
300 K2 *	400	714	455	198	1070	14,0	2541550300
400 K2 *	400	714	455	250	984	14,1	2541560300

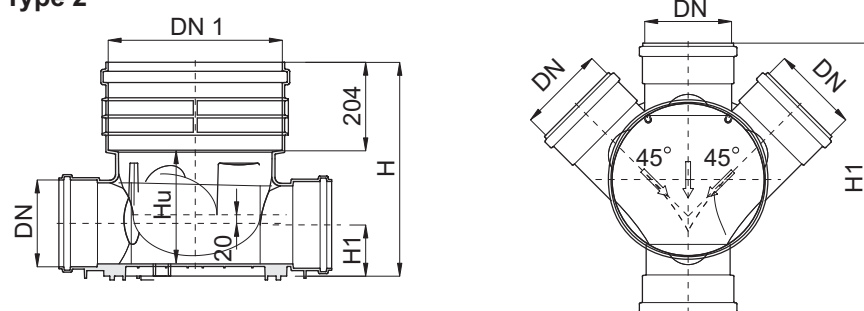
* no gaskets in connection bells

** base unit outlet – bare end

Multi-inlet base 400

with a gasket

Type 2



DN [mm]	DN 1 [mm]	H [mm]	Hu [mm]	H1 [mm]	L [mm]	Weight [kg]	index -
110	400	400	180	58	564	4,6	2541110300
160	400	456	222	100	636	5,4	2541120300
200	400	496	259	122	632	6,1	2541130300
250	400	714	455	168	1154	17,0	2541140300
315 **	400	714	455	198	1072	19,1	2541150300
200 K2 *	400	496	259	122	732	6,3	2541530300
250 K2 *	400	714	455	174	1074	16,9	2541540300
300 K2 *	400	714	455	198	1070	19,4	2541550300

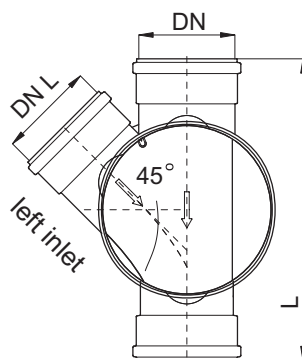
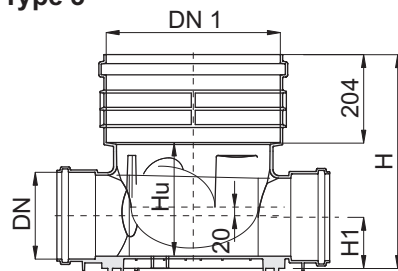
* no gaskets in connection bells

** base unit outlet – bare end

Flow-through base unit 400

with a gasket, with left inlet

Type 3



DN [mm]	DN L [mm]	DN 1 [mm]	H [mm]	Hu [mm]	H1 [mm]	L [mm]	Weight [kg]	index -
110	110	400	492	246	116	622	4,3	2543113300
160	160	400	492	246	116	622	4,6	2543123300
200	200	400	511	264	136	650	5,2	2543133300
250	250	400	720	462	168	1154	14,7	2543143300
315 **	315	400	720	462	198	1072	14,2	2543153300
200K2 *	200K2 *	400	400	180	68	564	4,5	2543533300
250K2 *	250K2 *	400	720	462	198	1072	14,2	2543543300
300K2 *	300K2 *	400	720	462	198	1072	14,2	2543553300

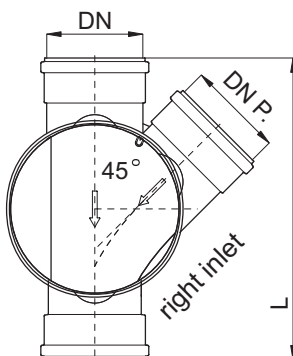
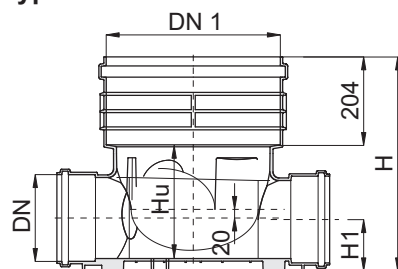
* no gaskets in connection bells

** base unit outlet – bare end

Flow-through base unit 400

with a gasket, with right inlet

Type 4



DN [mm]	DN L [mm]	DN 1 [mm]	H [mm]	Hu [mm]	H1 [mm]	L [mm]	Weight [kg]	index -
110	110	400	492	246	116	622	4,3	2544113300
160	160	400	492	246	116	622	4,6	2544123300
200	200	400	511	264	136	650	5,2	2544133300
250	250	400	720	462	168	1154	14,7	2544143300
315 **	315	400	720	462	198	1072	14,2	2544153300
200K2 *	200K2 *	400	400	180	68	564	4,5	2544533300
250K2 *	250K2 *	400	720	462	198	1072	14,2	2544543300
300K2 *	300K2 *	400	720	462	198	1072	14,2	2544553300

* no gaskets in connection bells

** base unit outlet – bare end

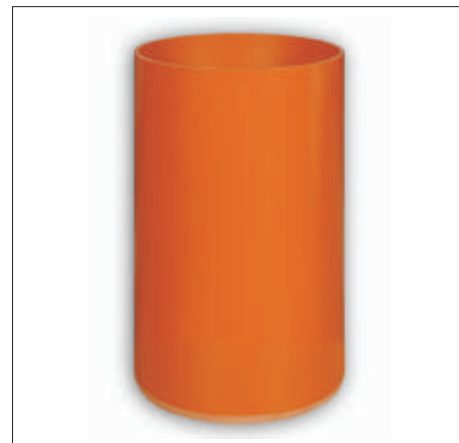
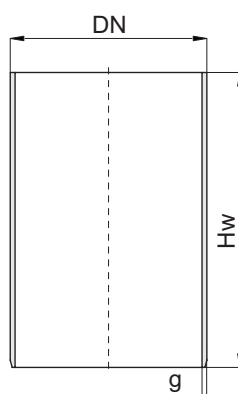
Unit base with additional inlets

with left or right inlet (45° or 90°)

with left and right inlet (45° or 90°)

DN [mm]	DN L [mm]	DN P. [mm]	DN 1 [mm]	H [mm]	Hu [mm]	H1 [mm]	L [mm]
400	200-300	200-300	400	720	462	198	1154
400	400 (90°)	400 (90°)	400	720	462	198	1154
400 K2	200-300	200-300	400	720	462	198	1154
400 K2	400 (90°)	400 (90°)	400	720	462	198	1154

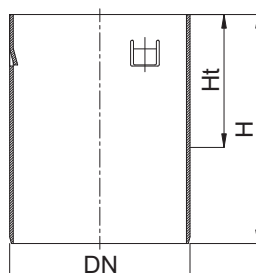
Riser pipe 400



DN [mm]	g [mm]	L [mm]	Weight [kg]	index -
400	7,9	1000	14,7	2713411100
400	7,9	2000	29,3	2713411200
400	7,9	3000	43,9	2713411300
400	7,9	6000	87,7	2713411600
400	9,8	3000	56,1	2713421300
400	9,8	6000	112,3	2713421600

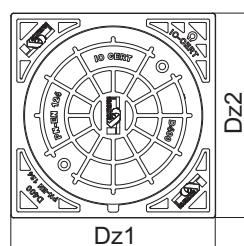
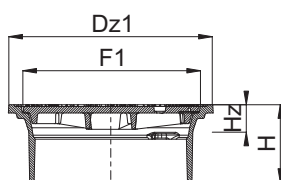
Telescope pipe 315

for a cast iron manhole top



DN [mm]	H [mm]	Ht [mm]	Weight [kg]	index -
315	400	200	3,7	2781321040
315	800	600	7,4	2781321080

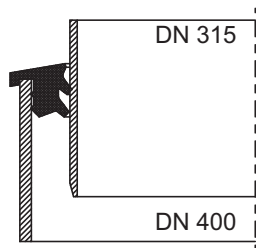
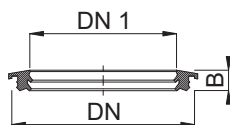
Cast iron chamber cover 315



	Dz1 [mm]	Dz2 [mm]	F1 [mm]	H [mm]	H1 [mm]	Weight [kg]	index -
A15	375	375	320	143	50	20,5	2901131100
B125	375	375	320	143	50	22,9	2901132100
B125 K	375	375	320	143	50	22,3	2902132100
D400	375	375	320	143	50	31,5	2901134100
D400 K	420	340	395/320	150	60	40,0	2902134100

Cuff gasket 400/315

for a telescope pipe

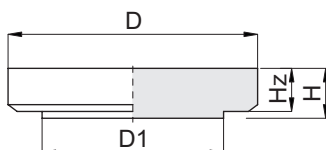


Installation example



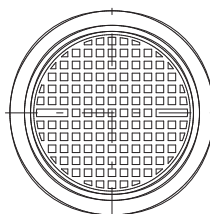
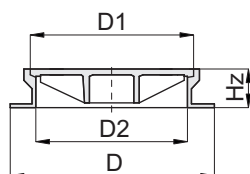
DN [mm]	DN 1 [mm]	B [mm]	Weight [kg]	index -
400	315	45	2,2	5165311060

Concrete cover 400



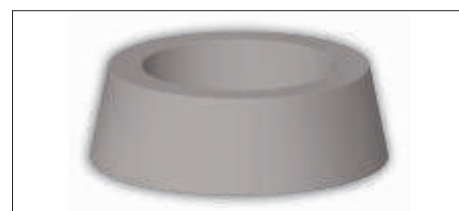
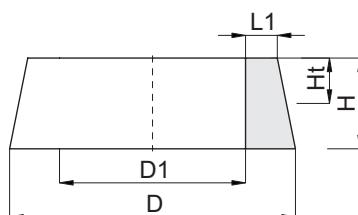
	DN [mm]	D [mm]	D1 [mm]	H [mm]	Hz [mm]	Weight [kg]	index -
A15	400	550	400	110	95	59,7	2952141000

Cast iron chamber cover 400



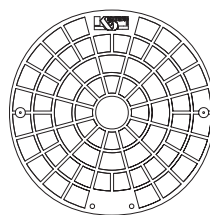
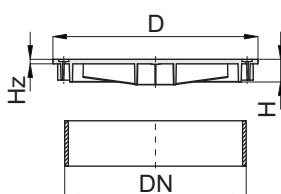
	DN [mm]	D [mm]	D1 [mm]	D2 [mm]	Hz [mm]	Weight [kg]	index -
B125	315	450	375	325	70	26,0	2901142500

Concrete taper 400



	DN [mm]	D [mm]	D1 [mm]	L1 [mm]	H [mm]	Ht [mm]	Weight [kg]	index -
B125	400	630	410	70	200	100	65,6	2951142000

PP Cover 400



	DN [mm]	D [mm]	H [mm]	Hz [mm]	Weight [kg]	index -
A15	400	452	50	10	1,8	2549405090

Technical features

Non-entry inspection chambers **DIAMIR 425 NW**

Main components of a chamber

-a **base unit, a base of an inspection chamber**, allowing for direct connection of storm water drainage or sanitary sewer systems installed in the ground, including incorporated channels with possible branches

-a **riser pipe of internal diameter equalling 425**

-a **telescope section, allowing for compensation of settlement** which may take place after installation and making it possible to adjust the chamber height. A telescope pipe is installed to the depth of 0,8 m below the ground level.



Standards:

-DIAMIR 425 NW inspection chamber is compliant with **EN 13598-2:2009**

EN 476:2011

-approval for use in road ROWs

Technical Approval **IBDiM AT/2010-02-0830**

Technical Approval **IK AT/07-2011-0242-00**

Technical Approval **IBDiM AT/2011-02-2706**

-GIG (Central Mining Institute) Opinion approving their use in the areas of mining damages up to the 4th category;

-Resistance of PP chamber components to chemical substances is compliant with the guidelines issued by

ISO/TR 10358

-Gully tops and manhole tops meet the requirements of standard

EN 124:2000

-Seals meet the requirements of standard

EN 681-1:2002

-Chemical resistance of elastomeric seals to chemical substances is compliant with the requirements of the

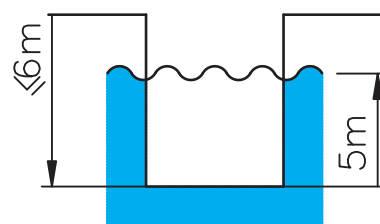
ISO/TR 7620 Guidelines

Usage:

-maximum installation depth 6 m

-acceptable ground water table 5 m

-acceptable load caused by traffic SLW60 according to ATV-A127P



Technical features

Technical data

Base units are made of polypropylene (PP), with reinforcing ribs. They are adapted to connection with vertical riser pipes. There is a horizontal channel in the base unit with one or a few inlet connector pipes and one outlet connector pipe ending with bells for connection with plain wall pipes made of PVC-U, PP or PE or connector pipes adapted to connection with structural pipes K2-KAN.



Type 1	Type 2			Type 3		Type 4	
DN	DN 1	DN	DN 1	DN 1	DN	DN	DN 1
110	110	110	110	110	110	110	110
160	160	160	160	160	160	160	160
200	200	200	200	200	200	200	200
250	250	250	250	250	250	250	250
315	315	315	315	315	315	315	315
400	200-400	400	200-400	200-400	400	400	200-400
200K2-Kan	200K2-Kan	200K2-Kan	200K2-Kan	200K2-Kan	200K2-Kan	200K2-Kan	200K2-Kan
250K2-Kan	250K2-Kan	250K2-Kan	250K2-Kan	250K2-Kan	250K2-Kan	250K2-Kan	250K2-Kan
300K2-Kan	300K2-Kan	300K2-Kan	300K2-Kan	300K2-Kan	300K2-Kan	300K2-Kan	300K2-Kan
400K2-Kan	200-400	400K2-Kan	200-400	200-400	400K2-Kan	400K2-Kan	200-400

A ball-and-socket joints $\pm 7,5^\circ$ may be used in connection bells 160; 200; 250; 315 (page 28)

Height adjustment

Non-entry inspection chambers **DIAMIR 425**

Specifications and height adjustment

Preparing specifications for materials required for an investment, total numbers of individual inspection chamber components should be indicated:

-base units, -riser pipes, -tops

The input parameter is chamber height specified in the design – the distance between the ground level and the chamber invert (base unit level). We label it as **Hs**.

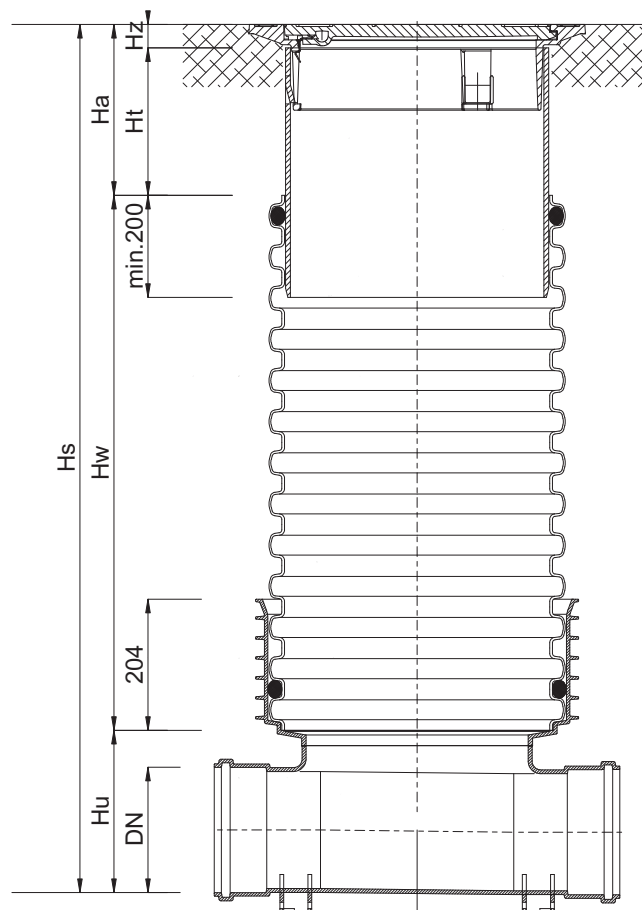
In order to make calculations easier, there is useful height (**Hu**) specified for each base unit type, that is, the difference between the bottom of a base unit and the bottom of base unit bell in which a riser pipe is installed.

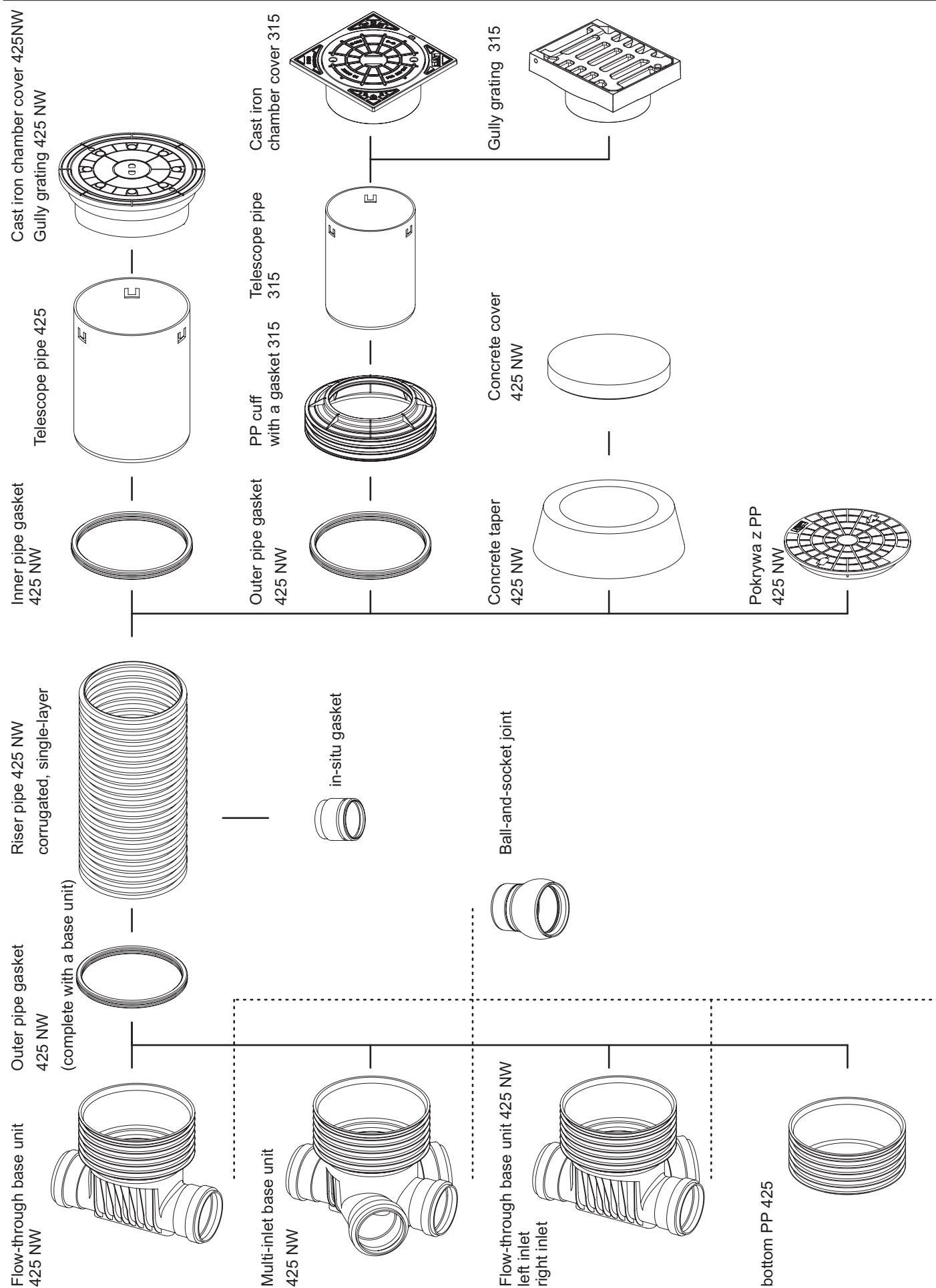
For calculations, we label the height of a riser pipe as **Hw**. The height of a top section (telescope) will be **Ha**. One should bear in mind that the useful height of the telescope must not be smaller than thickness of the structural pavement layer.

No-entry inspection chamber **DIAMIR 425**

$$H_s = H_u + H_w + H_a$$

$$H_a = H_t + H_z$$

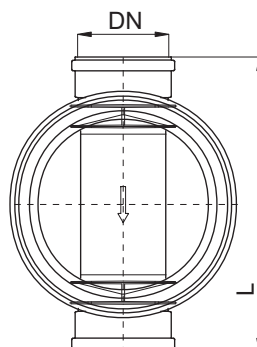
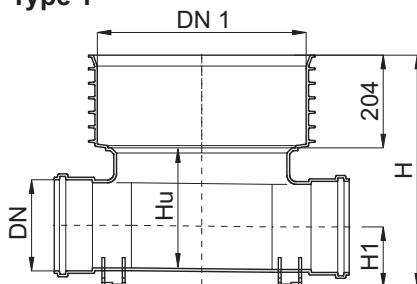




Flow-through base unit 425 NW

with a gasket

Type 1



DN [mm]	DN 1 [mm]	H [mm]	Hu [mm]	H1 [mm]	L [mm]	Weight [kg]	index -
110	478	452	206	96	622	4,1	2561110300
160	478	492	246	116	622	4,6	2561120300
200	478	511	264	136	650	5,2	2561130300
250	478	720	462	168	1154	14,7	2561140300
315 **	478	720	462	198	1072	14,2	2561150300
400 **	478	720	462	238	1076	15,3	2561160300
200 K2 *	478	511	264	136	680	5,3	2561530300
250 K2 *	478	720	462	174	1074	14,6	2561540300
300 K2 *	478	720	462	198	1070	14,5	2561550300
400 K2 *	478	720	462	250	984	14,6	2561560300

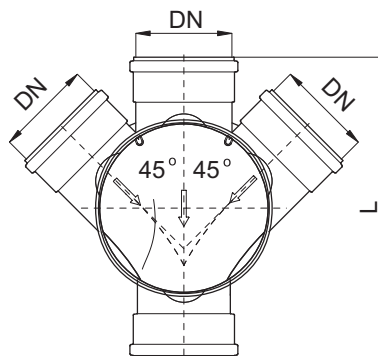
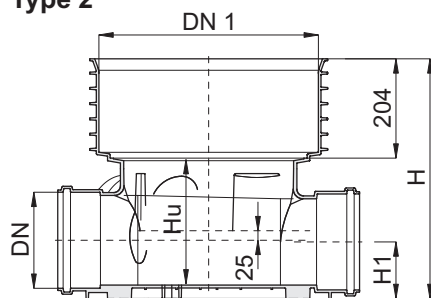
* no gaskets in connection bells

** base unit outlet – bare end

Multi-inlet base unit 425 NW

with a gasket

Type 2



DN [mm]	DN 1 [mm]	H [mm]	Hu [mm]	H1 [mm]	L [mm]	Weight [kg]	index -
110	478	422	190	60	596	5,2	2561110300
160	478	462	230	100	636	5,9	2561120300
200	478	496	266	122	632	6,6	2561130300
250	478	720	462	168	1154	17,5	2561140300
315 **	478	720	462	198	1072	19,6	2561150300
200 K2 *	478	502	266	122	732	6,8	2561530300
250 K2 *	478	720	462	174	1074	17,4	2561540300
300 K2 *	478	720	462	198	1070	19,8	2561550300

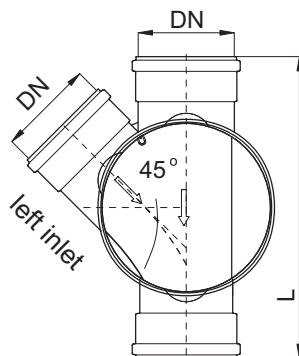
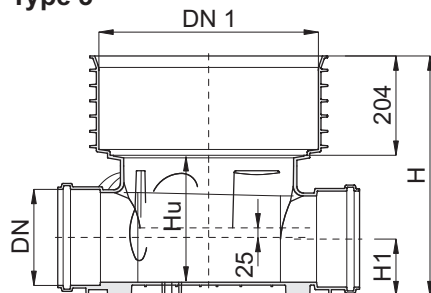
* no gaskets in connection bells

** base unit outlet – bare end

Flow-through base unit 425 NW

with a gasket, with left inlet

Type 3



DN [mm]	DN L [mm]	DN 1 [mm]	H [mm]	Hu [mm]	H1 [mm]	L [mm]	Weight [kg]	index -
110	110	478	492	246	116	622	4,6	2563113300
160	160	478	492	246	116	622	4,6	2563123300
200	200	478	511	264	136	650	5,2	2563133300
250	250	478	720	462	168	1154	14,7	2563143300
315 **	315	478	720	462	168	1154	14,7	2563153300
200K2 *	200K2 *	478	511	264	136	680	5,3	2563533300
250K2 *	250K2 *	478	720	462	198	1072	14,2	2563543300
300K2 *	300K2 *	478	720	462	198	1072	14,2	2563553300

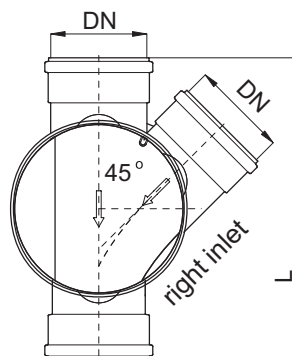
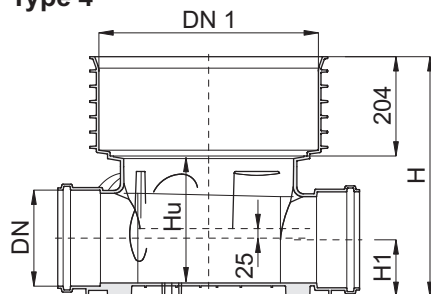
* no gaskets in connection bells

** base unit outlet – bare end

Flow-through base unit 425 NW

with a gasket, with right inlet

Type 4



DN [mm]	DN L [mm]	DN 1 [mm]	H [mm]	Hu [mm]	H1 [mm]	L [mm]	Weight [kg]	index -
110	110	478	492	246	116	622	4,6	2564113300
160	160	478	492	246	116	622	4,6	2564123300
200	200	478	511	264	136	650	5,2	2564133300
250	250	478	720	462	168	1154	14,7	2564143300
315 **	315	478	720	462	168	1154	14,7	2564153300
200K2 *	200K2 *	478	511	264	136	680	5,3	2564533300
250K2 *	250K2 *	478	720	462	198	1072	14,2	2564543300
300K2 *	300K2 *	478	720	462	198	1072	14,2	2564553300

* no gaskets in connection bells

** base unit outlet – bare end

Flow-through base unit with additional inlets

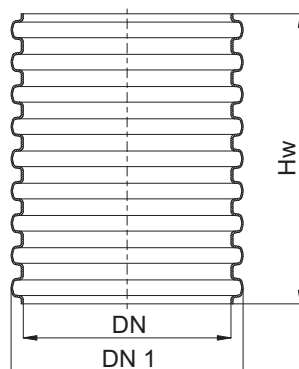
with left or right inlet (45° or 90°)

with left and right inlet (45° or 90°)

DN [mm]	DN L [mm]	DN P. [mm]	DN 1 [mm]	H [mm]	Hu [mm]	H1 [mm]	L [mm]
400	200-300	200-300	478	720	462	198	1154
400	400 (90°)	400 (90°)	478	720	462	198	1154
400 K2	200-300	200-300	478	720	462	198	1154
400 K2	400 (90°)	400 (90°)	478	720	462	198	1154

Riser pipe 425 NW

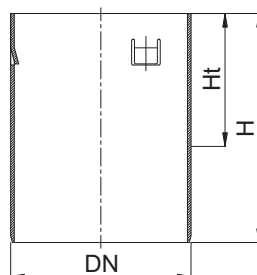
corrugated, single layer
SN 4



DN [mm]	DN 1 [mm]	Hw [mm]	Weight [kg]	index -
425	475	1000	6,7	2713632100
425	475	2000	13,4	2713632200
425	475	3000	20,1	2713632300
425	475	6000	40,2	2713632600

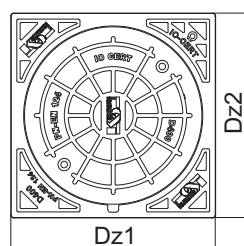
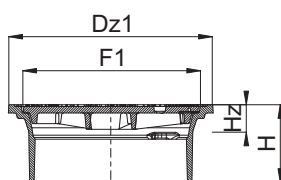
Telescope pipe 315

for a cast iron chamber cover



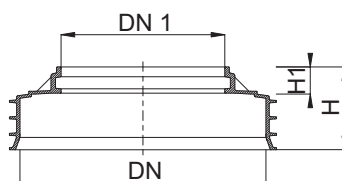
DN [mm]	H [mm]	Ht [mm]	Weight [kg]	index -
315	400	200	3,7	2781321040
315	800	600	7,4	2781321080

Cast iron chamber cover 315



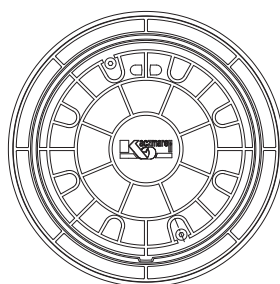
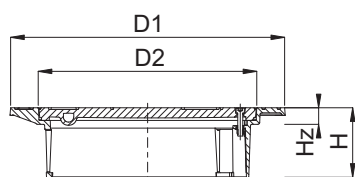
	Dz1 [mm]	Dz2 [mm]	F1 [mm]	H [mm]	H1 [mm]	Weight [kg]	index -
A15	375	375	320	143	50	20,5	2901131100
B125	375	375	320	143	50	22,9	2901132100
B125 K	375	375	320	143	50	22,3	2902132100
D400	375	375	320	143	50	31,5	2901134100
D400 K	420	470	340/340	150	60	40,0	2902134100

PP cuff 425 NW with a gasket 315



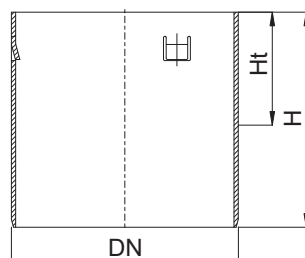
DN [mm]	DN 1 [mm]	H [mm]	H1 [mm]	Weight [kg]	index -
425	315	161	52	2,6	2569250090

Cast iron chamber cover 425 NW



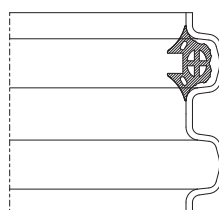
	D1 [mm]	D2 [mm]	H [mm]	H _z [mm]	Weight [kg]	index -
D400	540	428	138	35	36,0	2901164100

Telescope pipe 425 for a cast iron chamber cover 425 NW



DN [mm]	H [mm]	H _t [mm]	Weight [kg]	index -
425	400	200	6,3	2781612040
425	800	600	12,6	2781612080

Corrugated pipe gasket 425 NW all-purpose



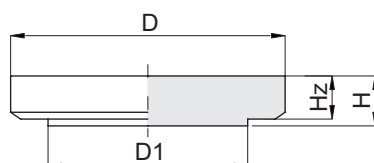
Assemblage example



DN [mm]	B [mm]	Weight [kg]	index -
425	49	1,0	5162151050

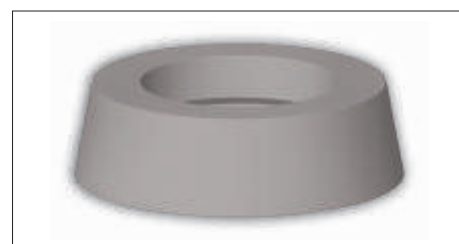
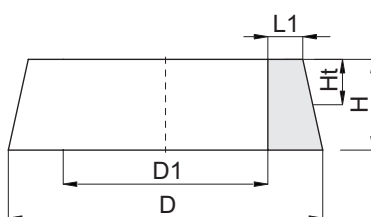
gasket installed outside or inside riser pipe groove

Concrete cover 425 NW



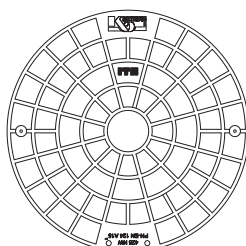
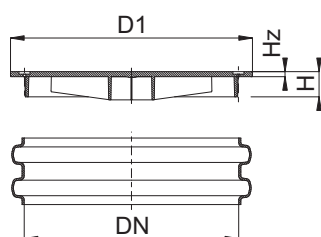
	DN [mm]	D [mm]	D1 [mm]	H [mm]	H _z [mm]	Weight [kg]	index -
A15	425	650	475	110	95	64,5	2952161000

Concrete taper 425 NW



	DN [mm]	D [mm]	D1 [mm]	L1 [mm]	H [mm]	H _t [mm]	Weight [kg]	index -
B125	425	715	485	80	220	110	75,4	2951162000

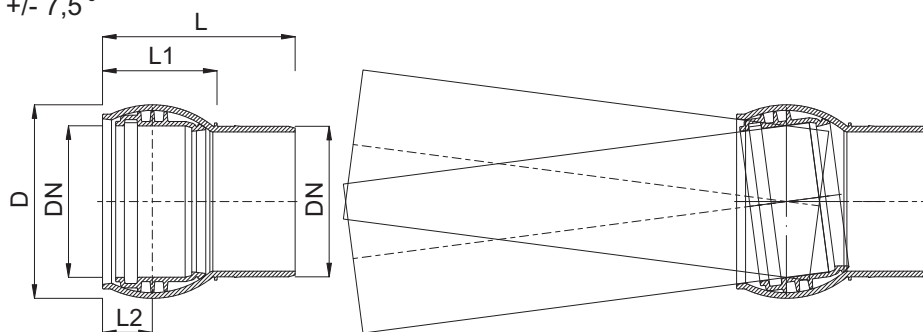
PP cover 425 NW



	DN [mm]	D1 [mm]	H [mm]	H _z [mm]	Weight [kg]	index -
A15	425	480	50	10	2,1	2569405090

Ball-and-socket joint

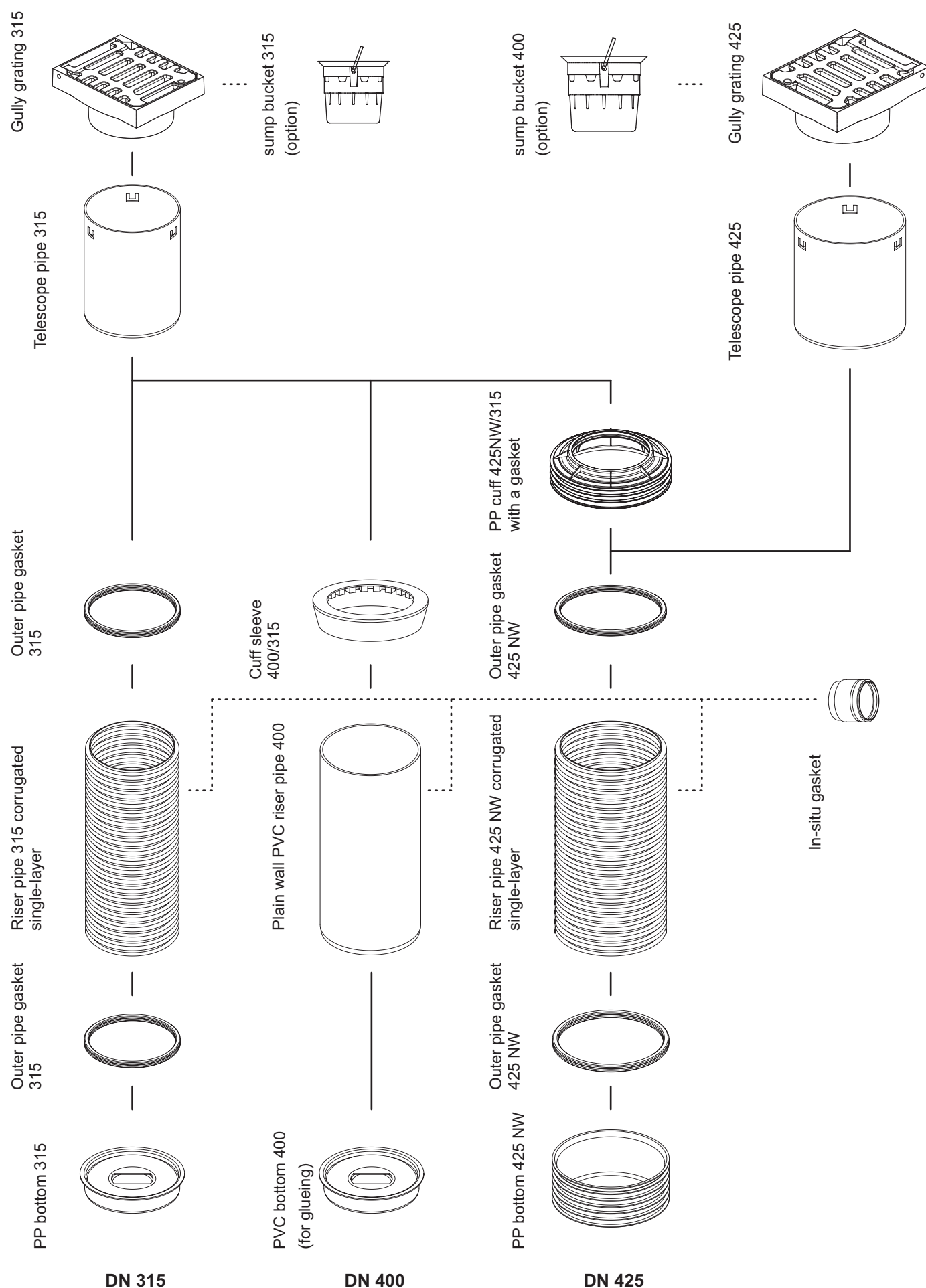
$\pm 7,5^\circ$



DN [mm]	D [mm]	L1 [mm]	L2 [mm]	L [mm]	Weight [kg]	index -
160	206	122	53	205	0,9	0718233310
200	254	146	63	245	1,7	0718253310
250	320	186	80	305	3,4	0718273310
315	395	217	92	362	6,1	0718293310

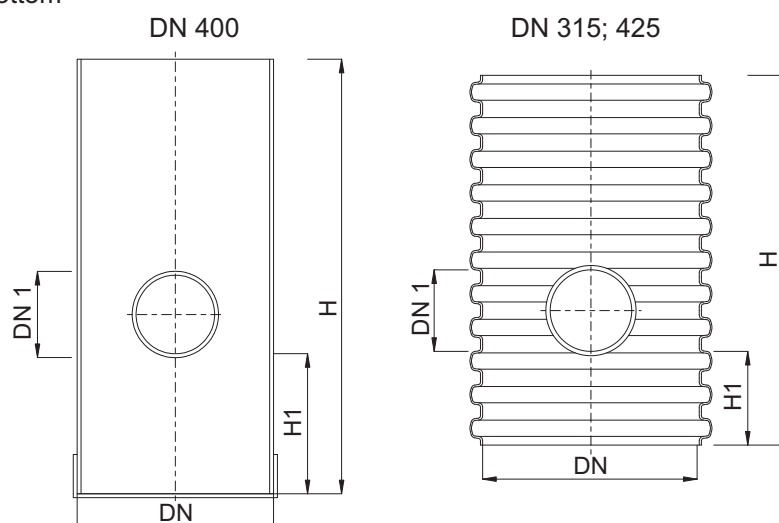
Catch basins with a sump **DIAMIR 315; 400; 425**

Solution options



Catch basin with a sump

with a bottom

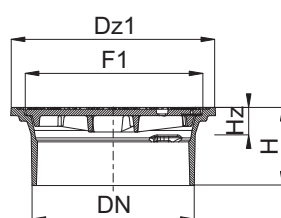
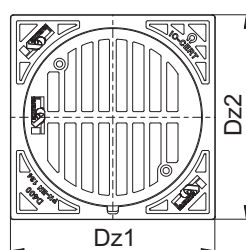


DN	Dw [mm]	Dz [mm]	D1 [mm]	H1 [mm]	H * [mm]	Weight [kg]	Weightindex -
315	315	355	110	500	2000	9,0	2813110200
315	315	355	160	500	2000	9,9	2813120200
400	380	400	110	320	2000	48,3	2814110200
400	380	400	160	320	2000	49,0	2814120200
425	425	475	110	320	2000	15,5	2816110200
425	425	475	160	320	2000	16,1	2816120200

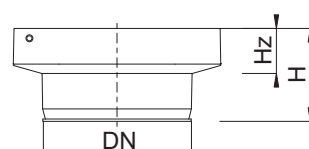
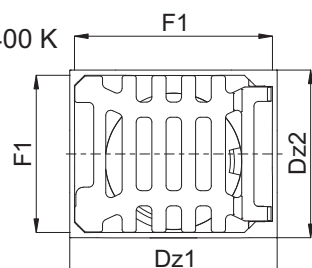
* other chamber heights are available on request

Stormwater gully

B125 K

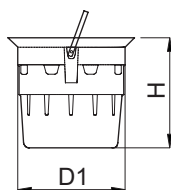


D400 K



	DN [mm]	Dz1 [mm]	Dz2 [mm]	F1 [mm]	H [mm]	H1 [mm]	Inlet area [dm ²]	Weight [kg]	index -
B125 K	315	375	375	320	143	50	3,3	22,3	2902132100
D400 K	315	420	340	395/320	185	90	5,3	40,0	2902134100
D400 K	425	500	500	474/474	210	115	9,0	76,4	2902164100

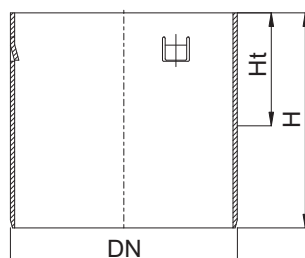
Sump bucket



DN	D1 [mm]	H [mm]	Weight [kg]	index -
315	315	250	1,0	2981133100
400	400	240	3,0	2981163100

Telescope pipe

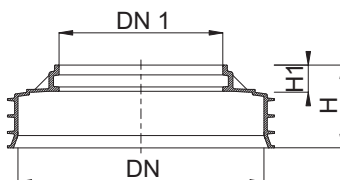
for a cast iron chamber cover



DN [mm]	H [mm]	Ht [mm]	Weight [kg]	index -
315	400	200	3,7	2781612040
315	800	600	7,4	2781612080
425	400	200	6,3	2781612040
425	800	600	12,6	2781612080

PP cuff 425 NW

with gasket 315



DN [mm]	DN 1 [mm]	H [mm]	H1 [mm]	Weight [kg]	index -
425	315	161	52	2,6	2569250090

Sump bottom



DN	D1 [mm]	H [mm]	Weight [kg]	index -
315	315	80	0,6	2539911090
400 *	400	105	4,0	2549921030
425	425	160	3,6	2569911030

* for gluing

Sump chamber gasket

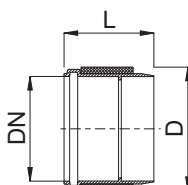
all-purpose



DN	B [mm]	Weight [kg]	index -
315	20	0,3	5162131050
425	49	1,0	5162151050

a gasket installed outside or inside riser pipe groove

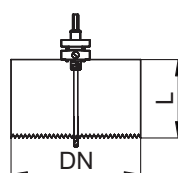
In-situ gasket



DN	D1 [mm]	L [mm]	Weight [kg]	index -
110	138	120	0,5	5168201010
160	177	120	0,8	5168231010

Hole cutter

Cutter holder – all-purpose



DN	D1 [mm]	L [mm]	Weight [kg]	index
110	138	90	0,8	5191202100
160	177	90	1,2	5191231100
all purpose	-	-	0,6	5191000100

Installation instructions

DIAMIR inspection chambers should be installed in conditions specified in the technical design. The ground around chambers (0.3 m) should be composed of compactable soil, approved for use in road construction according to standard PN-S-02205:1998. Earthworks should be carried out in accordance with standard PN-EN 1610:2002/Ap1:2007. Soil compaction should be performed in layers as specified in standard PN-ENV 1046:2007 to prevent from excessive ovalisation of a chamber cross-section.



1 Prepare a trench in an inspection chamber location removing large and sharp-edged stones. On the trench bottom prepare bedding composed of compactable soil, preferably sand (coarse- medium- or fine-grained) of minimum 10 cm thickness. An inspection chamber zone should include an area of at least a 30 cm wide strip around the chamber.



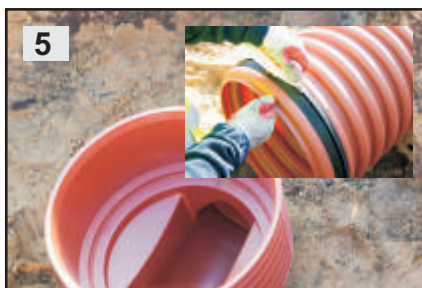
2 Place a base unit on a prepared earlier sand bedding and level it and then connect sewage pipes to the chamber.



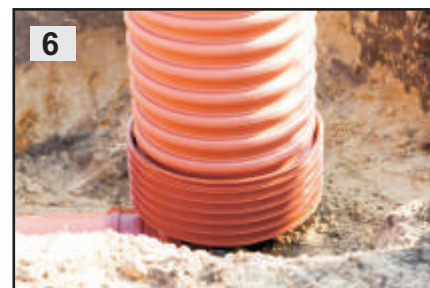
3 Fill up the trench with preliminary backfill (10 cm above the pipe level). Compaction should be performed manually, in layers every 15 cm or with light mechanical equipment (each layer up to 30 cm). Base unit socket should protrude above the backfill level.



4 Prepare a corrugated riser pipe of the required length. The pipe can be cut to the required chamber height. Install a gasket in the lowest groove on the outside of the riser pipe. The gasket is delivered along with a base unit.



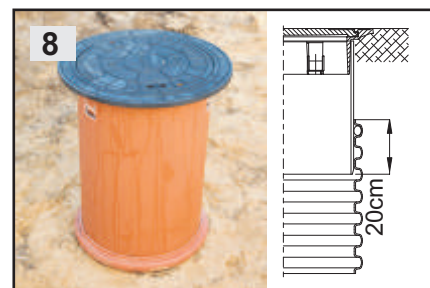
5 Lubricant should be applied on the inner side of a base unit socket and gasket. Products approved for rubber gaskets and plastic should be used.



6 Insert a riser pipe with an installed gasket into a base unit.



7 Compact the area around the pipe. Compaction should be performed manually, in layers every 15 cm or with light mechanical equipment (each layer up to 30 cm) in open areas to at least 90% of the Proctor compaction test and for inspection chambers located in a carriageway or road shoulder backfill should meet the requirements specified for compaction index resulting from the installation depth, road construction type (cutting, embankment) or traffic intensity category.



8 For inspection chambers equipped with riser pipes connected with telescope pipes with a gasket, ensure a telescope pipe is inserted into a riser pipe to the depth of approximately 20 cm.

Inspection chamber tops

Location of a DIAMIR chamber and expected load caused by traffic are the basis for selection of riser and telescope pipe stiffness and a choice of cast iron covers.

Depending on the chamber location within a ROW and a traffic intensity category, different manhole/gully tops are used, also construction requirements and top type which are classified into the following groups may differ.

Group 1 - Class A15 - green areas intended solely for pedestrians and pedal cyclists

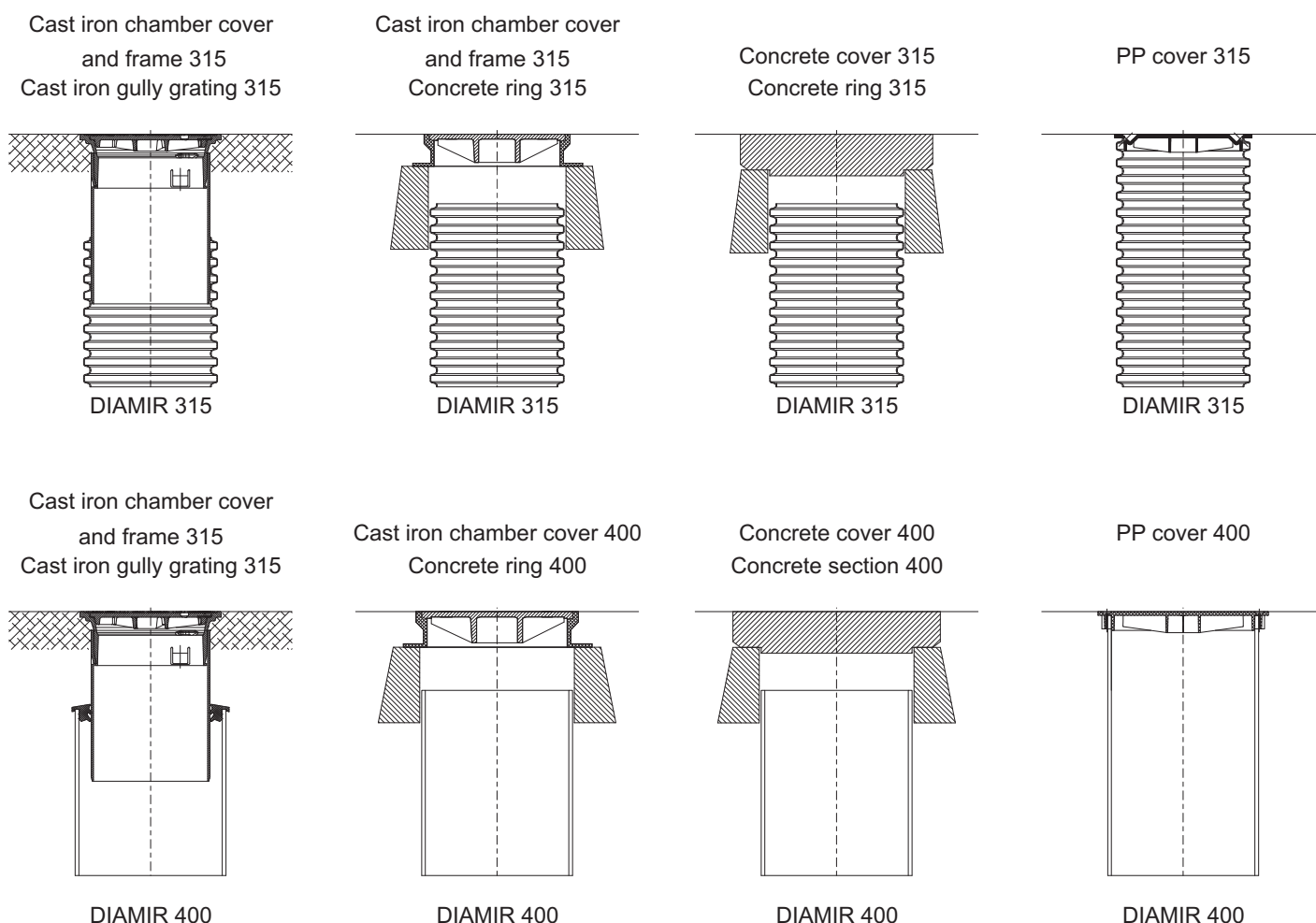
Group 2 - Class B125 - Roads and areas for pedestrians, and comparable areas, parking lots or places where cars are parked

Group 3 - Class C250 - Applies solely do sewer gully tops installed in the area of kerbside channels of roads and road shoulders

Group 4 - Class D400 - Carriageways of roads (including pedestrian streets) hard shoulders, and parking areas for all types of road vehicles

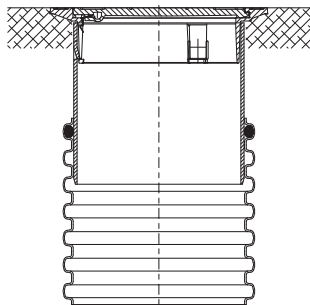
There are different rules of the manhole/gully top support depending on their type and class, and soil conditions. A manhole/gully top should sit on a reinforced concrete slab which is supported by an appropriately constructed load bearing structure adapted to loads caused by traffic. That may be reinforced bedding made of well compacted soil or a precast load-relieving slab made of reinforced concrete.

For very heavy load caused by traffic or doubts about compaction of soil constituting the top base, a slab with the chamber top should be based on a B30 concrete ring of minimum height of 20 cast on the building site



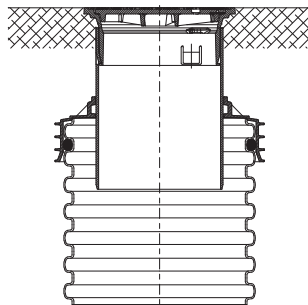
Inspection chamber tops

Cast iron cover and frame 425
Gully grating 425



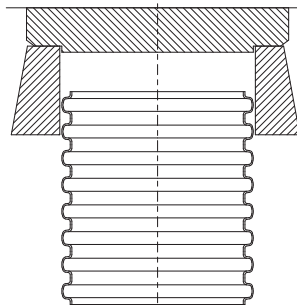
DIAMIR 425

Cast iron cover and frame 315
Gully grating 315



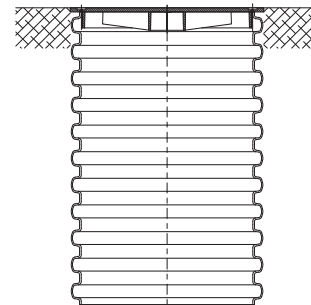
DIAMIR 425

Concrete cover 425
Concrete ring 425



DIAMIR 425

PP cover 425



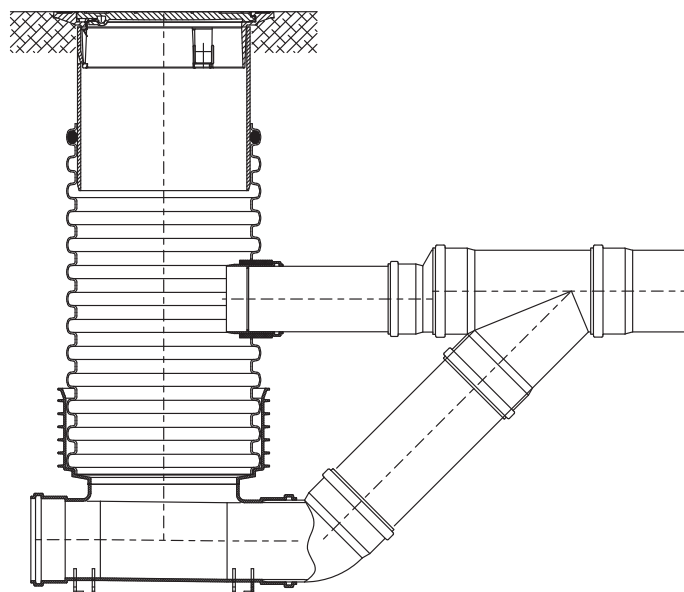
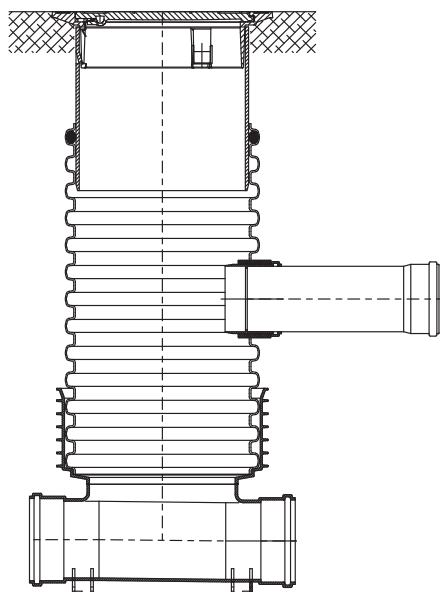
DIAMIR 425

Backdrop manholes

Sometimes it is necessary to connect a channel to a manhole above a base unit. Then, a so called backdrop manhole is constructed. According to standard PN-B-10729 "backdrop manholes in channels of diameters up to 0,40 m and drop height from 0,5 – 4,0 m may be constructed with a backdrop pipe placed inside or outside of a manhole. In a non-entry inspection chamber a drop pipe may be not installed.

That means that for non-entry inspection chambers, if a channel diameter does not exceed 160 mm, connection may be made through a hole in a riser pipe.

Appropriate in-situ gaskets are installed in the hole. If a channel is a K2-Kan structured pipe, a special fitting (adapter to a PVC socket) should be inserted into the in-situ insert. A backdrop pipe is not used. However, if a channel diameter exceeds 200 mm, a backdrop pipe has to be used and it should be connected to a chamber base unit. A T-branch connection is fitted to the channel. One of T-branches is connected to the backdrop pipe and the second (after diameter reduction to 60 mm) is connected to a riser pipe (a hole with an in-situ gasket).



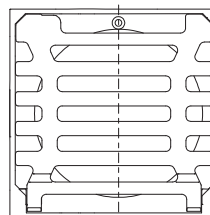
Catch basins with sumps

A catch basin is constructed using a corrugated riser pipe DN 315, 425 or plain wall pipe 400. A pre-blinded pipe of appropriate length should be ordered, it may be also blinded on a building site. A tight basin bottom blinds the pipe. For storm water chambers, a top is a cast iron grating mounted on a telescope pipe. For a drain age chambers all other tops specified in the catalogue of DIAMIR manholes/chambers are applied. They are used depending on the existing loads and investor preferences. In a riser pipe holes are made to construct appropriate outlets or inlets. Appropriate in-situ gaskets should be installed in the holes. In-situ gasket tightness depends on the riser pipe used. See the Declaration of Conformity for details.

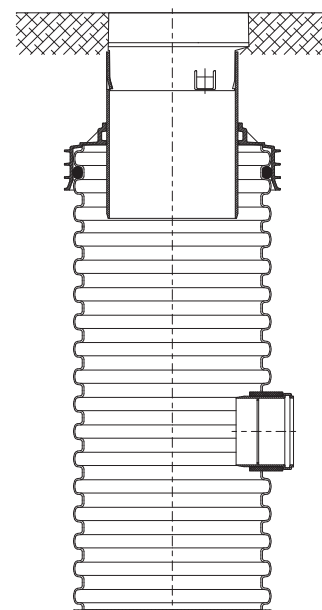
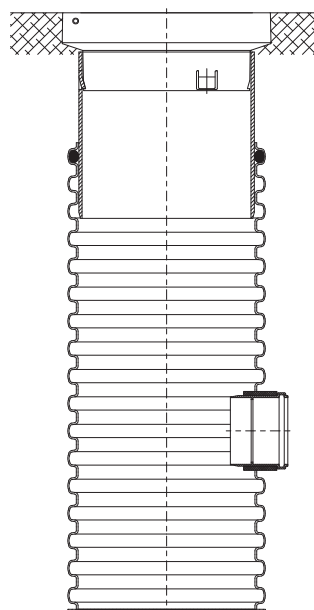
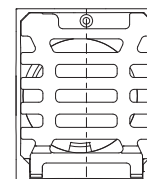
In drainage chambers gaskets are mounted in situ and connectors are inserted to drainage pipes.

Note: There are precast drainage and storm water chambers available.

Gully grating 425 D400
500x500



Gully grating 315 D400
420x340



“In situ” gasket installation instructions

Intended use:

-“in-situ” gaskets 110 i 160 are used for connecting plastic pipes to riser pipes of inspection chambers DIAMIR 315, 400, 425, 600, 1000;

-“in-situ” gasket 200 is used for connecting plastic pipes to risers of inspection chambers DIAMIR 600, 1000.



Bore a hole of the required diameter in the chamber riser and then remove remaining burrs.

NOTE! A hole for an in-situ gasket may be made only outside the base unit socket.



Insert the “in-situ” gasket so that an outer flange will adjoin a riser outer wall. The in-situ gasket should be coated with lubricant from inside.



Press in a hub into an “in-situ” gasket to its end. Connect a sewage pipe of an appropriate diameter.

Technical features

Non-entry inspection chambers **DIAMIR 600**

Main components of a chamber

-**base unit, a base of an inspection chamber**, allowing for direct connection of storm water drainage or sanitary sewer systems installed in the ground, including incorporated channels with possible branches along with possible branches

-**a riser, riser pipe** of internal diameter equalling 600

-**a telescope** section, allowing for compensation of settlement which may take place after installation and making it possible to adjust the chamber height A telescope pipe is installed to the depth of 0,8 m below the ground level.

Standards:

-DIAMIR 600 inspection chamber is compliant with

EN 13598-2:2009

EN 476:2011

-approval for use in road ROWs

Technical Approval **IBDiM AT/2010-02-2706**

Technical approval **IK AT/07-2011-0242-00**

Technical Approval **IBDiM AT/2011-02-2706**

-**GIG (Central Mining Institute) Opinion approving their use in the areas** of mining damages up to the 4th category

-Chemical resistance of chamber PP components to chemical substances is compliant with

the ISO/TR 10358 Guidelines

-Gully tops and manhole tops meet the requirements of standard

EN 124:2000

Seals meet the requirements of standard

EN 681-1:2002

-Chemical resistance of elastomeric seals to chemical substances is compliant with

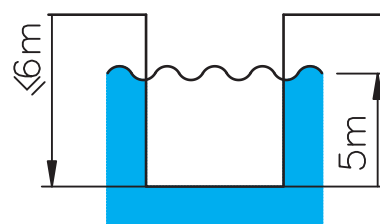
the ISO/TR 7620 Guidelines

Usage:

-maximum installation depth 6 m

-acceptable ground water table 5 m

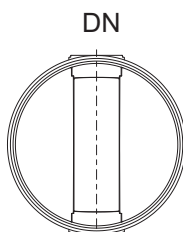
-acceptable load caused by traffic SLW60 according to ATV-A127P



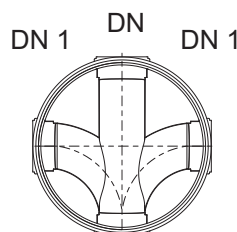
Technical features

Technical data

Base units are made of polypropylene, with reinforcing ribs. They are adapted to connection with vertical riser pipes vertical riser pipes. There is a horizontal channel in the base unit with one or a few inlet connector pipes and one outlet connector pipe ending with bells for connection with plain wall pipes made of PVC-U, PP or PE or connector pipes adapted to connection with structural pipes K2-KAN.



Type 1 0°



Type 2 90°

DN	DN 1	DN	DN 1
160	160	160	160
200	200	200	200
250	250	250	250
315	315	315	315
400	-	-	-
200K2-Kan	200K2-Kan	200K2-Kan	200K2-Kan
250K2-Kan	250K2-Kan	250K2-Kan	250K2-Kan
300K2-Kan	300K2-Kan	300K2-Kan	300K2-Kan
400K2-Kan	-	-	-

A ball-and-socket joints $\pm 7,5^\circ$ may be used in connection bells 160; 200; 250; 315 (page 28)

- for other base unit variants consult the manufacturer

Height adjustment

Non-entry inspection chambers **DIAMIR 600**

Specifications and height adjustment

Preparing specifications for materials required for an investment, total numbers of individual inspection chamber components should be indicated:

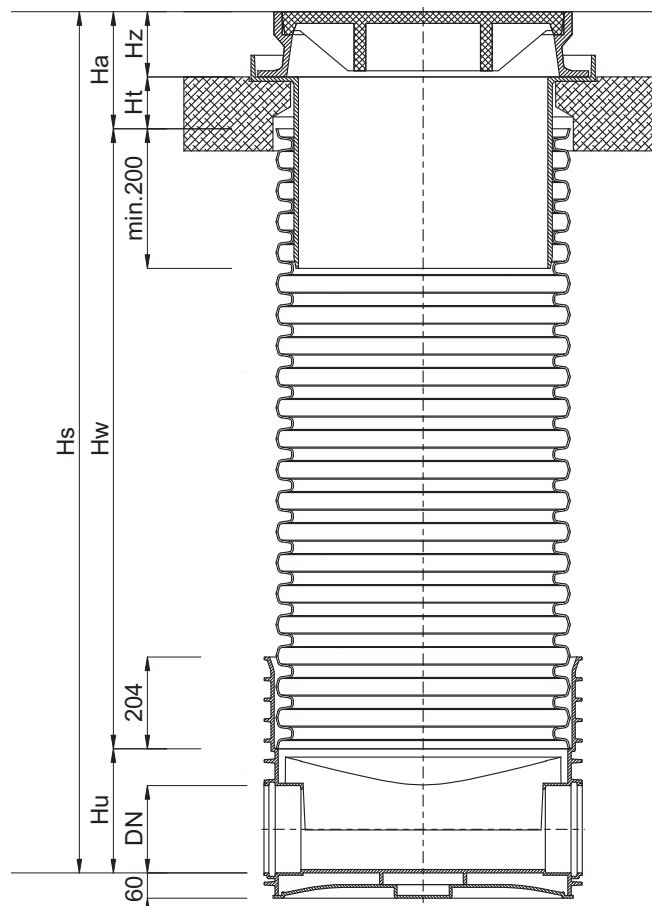
-base units, -riser pipes, -tops

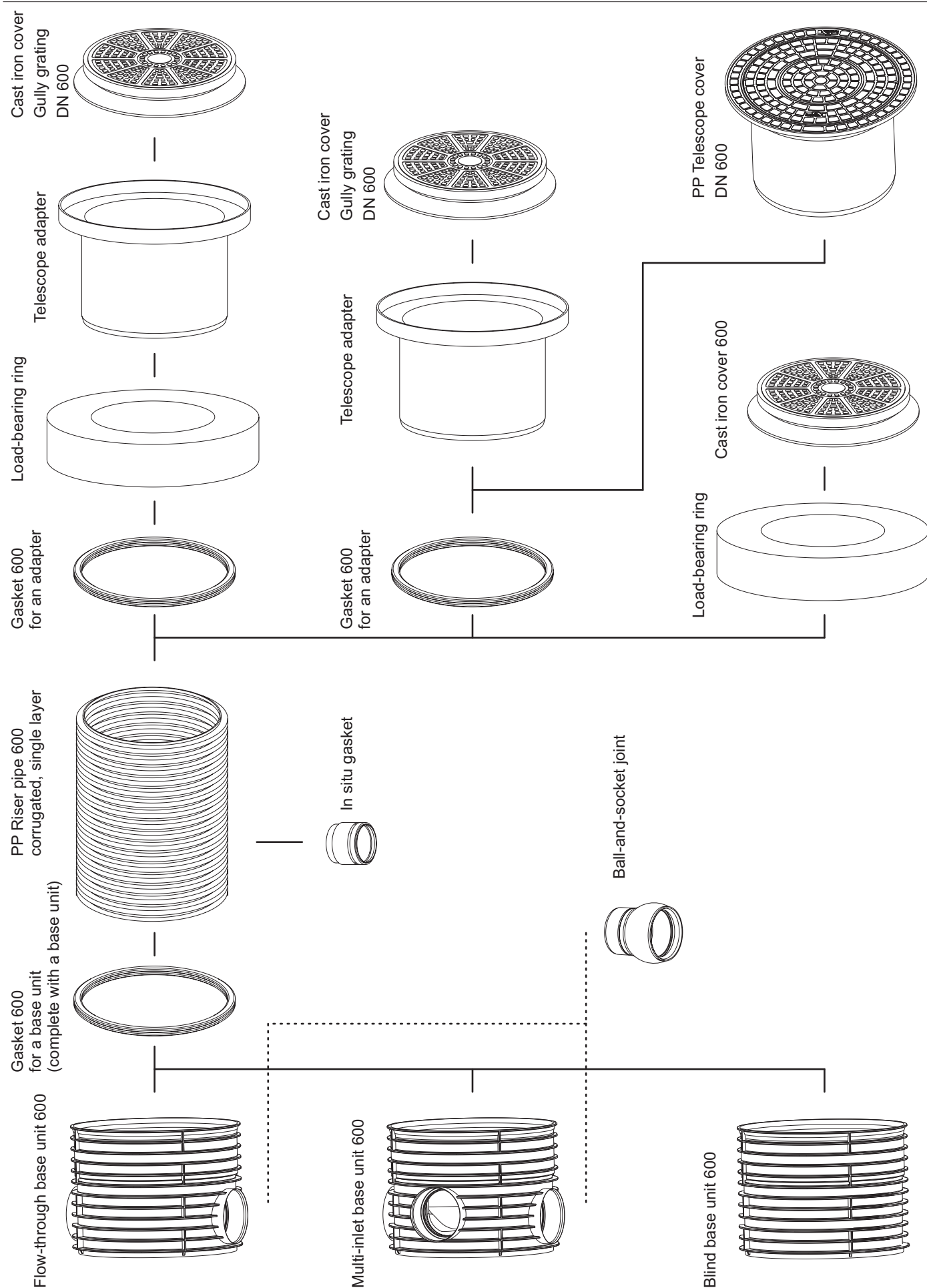
The input parameter is chamber height specified in the design – the distance between the ground level and the chamber bottom (base unit level). We label it as **Hs**. In order to make calculations easier, there is useful height (**Hu**) specified for each base unit type, that is, the difference between the bottom of a base unit and the bottom of base unit socket in which a riser pipe is installed. For calculations, we label the height of a riser pipe as **Hw**. The height of a top section (telescope) will be **Ha**. One should bear in mind that the useful height of the telescope must not be smaller than thickness of the structural pavement layer.

No-entry inspection chamber **DIAMIR 600**

$$H_s = H_u + H_w + H_a$$

$$H_a = H_t + H_z$$

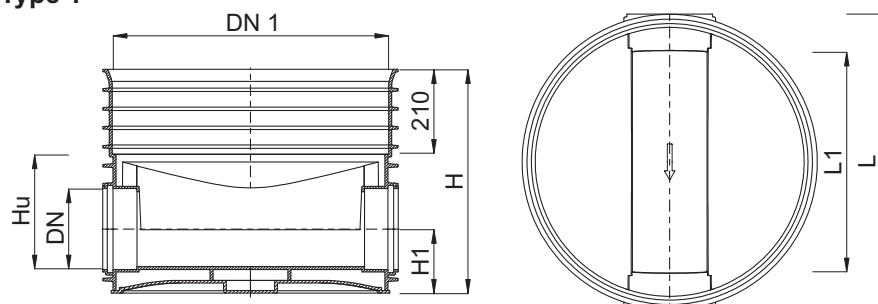




Flow-through base unit 600

with a gasket

Type 1



DN [mm]	DN 1 [mm]	H [mm]	Hu [mm]	H1 [mm]	L [mm]	L1 [mm]	Weight [kg]	index -
160	685	556	260	160	732	572	19,1	2581120300
200	685	556	278	160	732	552	21,7	2581130300
250	865	704	378	233	739	508	23,1	2581140300
315	685	704	407	233	739	475	23,6	2581150300
400	685	704	432	248	1218	544	28,2	2581160300
200 K2 *	685	556	278	165	753	552	21,7	2581530300
250 K2 *	685	704	378	240	762	508	23,1	2581540300
300 K2 *	685	704	407	235	778	475	23,6	2581550300
400 K2 *	685	704	432	260	1230	544	29,2	2581560300

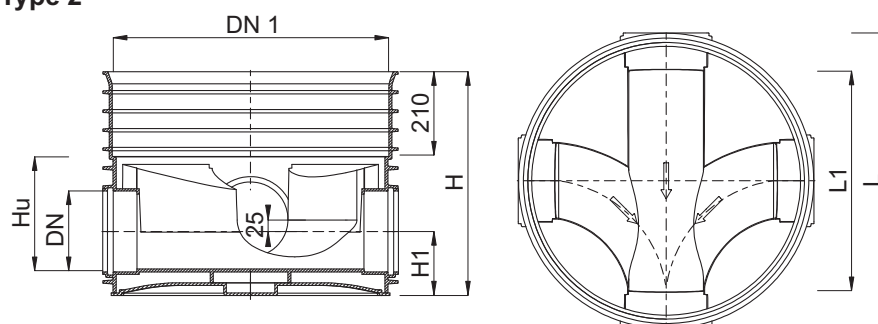
* no gaskets in connection sockets

for other base unit variants consult the manufacturer

Multi-inlet base unit

with a gasket

Type 2



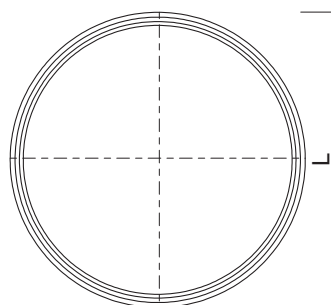
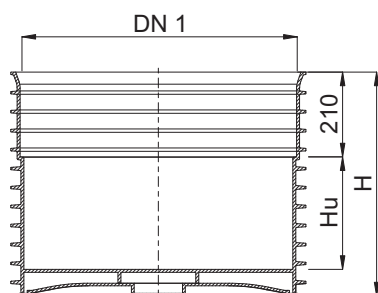
DN [mm]	DN 1 [mm]	H [mm]	Hu [mm]	H1 [mm]	L [mm]	L1 [mm]	Weight [kg]	index -
160	685	556	260	160	732	572	19,7	2582126300
200	685	556	278	160	732	552	21,9	2582136300
250	865	704	378	233	739	508	23,5	2582146300
315	685	704	407	233	739	475	24,3	2582156300
200 K2 *	685	556	278	165	753	552	21,9	2582536300
250 K2 *	685	704	378	240	762	508	23,5	2582546300
300 K2 *	685	704	407	235	778	475	24,3	2582556300

* no gaskets in connection sockets

other base unit variants to be discussed with the manufacturer

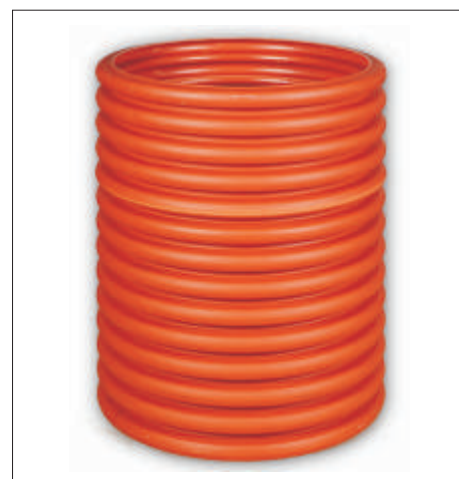
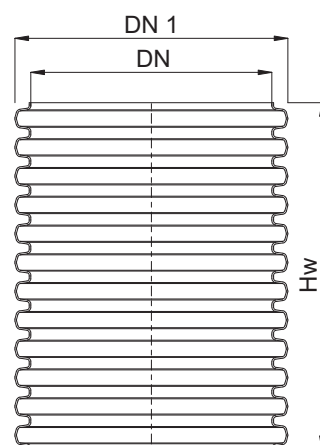
Blind base unit 600

with a gasket



DN [mm]	DN 1 [mm]	H [mm]	Hu [mm]	L [mm]	Weight [kg]	index -
600	685	618	268	732	21,1	2580000300

Single-layer riser pipe 600



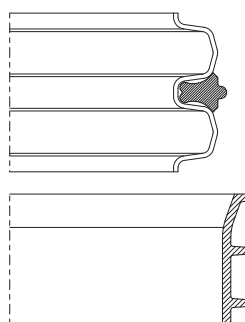
DN [mm]	DN 1 [mm]	Hw [mm]	Weight [kg]	index -
600	683	1000	6,2	2713832100
600	683	2000	12,3	2713832200
600	683	3000	18,9	2713832300
600	683	6000	37,8	2713832600

Gasket 600

for a base unit



Pipe DN 600



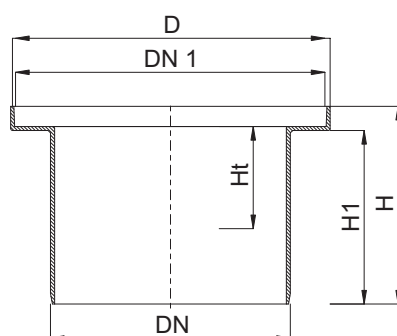
Base unit DN 600



DN [mm]	H [mm]	Weight [kg]	index -
600	35	2,0	5161181010

Telescope adapter 600

with a gasket

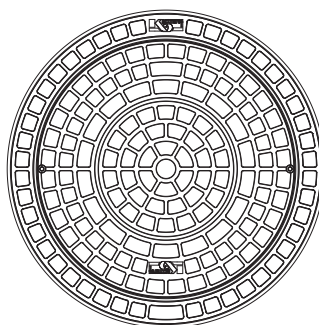
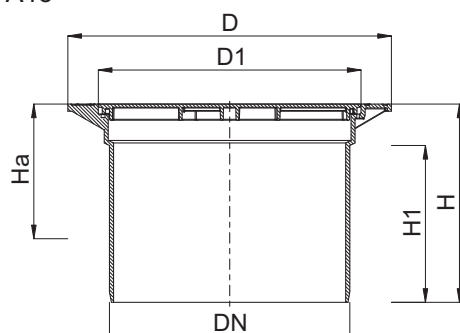


DN [mm]	DN 1 [mm]	D [mm]	H [mm]	H1 [mm]	Ht [mm]	Weight [kg]	index -
600	770	800	490	440	290	9,6	2589120090
600	850	870	490	440	290	10,6	2589140090

PP Telescope cover 600

with a gasket

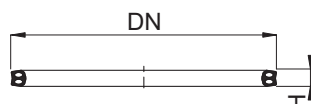
A15



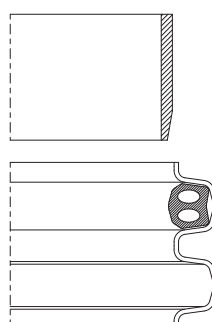
DN [mm]	D [mm]	D1 [mm]	H [mm]	H1 [mm]	Ha [mm]	Weight [kg]	index -
600	800	650	490	390	290	13,9	2589411090

Gasket 600

- for adapter 600
- for PP telescope cover 600



Adapter DN 600

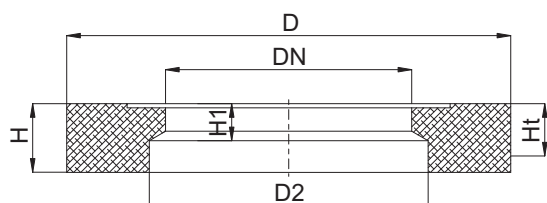


Pipe DN 600



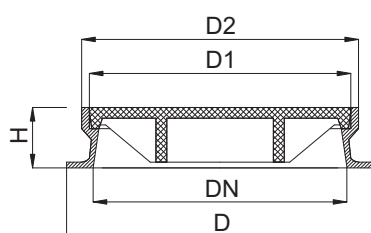
DN [mm]	H [mm]	Weight [kg]	index -
600	40	2,3	5163181010

Load bearing ring 600



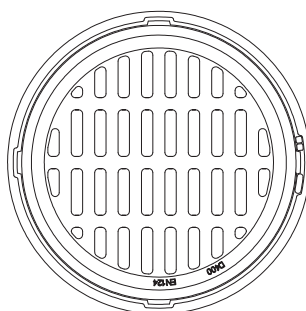
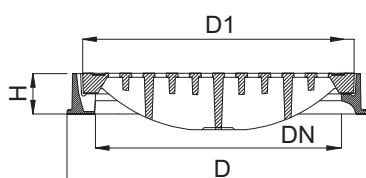
DN [mm]	D [mm]	D2 [mm]	H [mm]	H1 [mm]	Ht [mm]	Weight [kg]	index -
600	1100	690	170	90	120	220,0	2953184000

Cast iron cover 600



	DN [mm]	DN 1 [mm]	D1 [mm]	D2 [mm]	H [mm]	Weight [kg]	index -
A15	600	680	630	670	50	35,9	2901281500
B125	600	750	640	680	150	103,5	2901282500
C250	600	750	640	680	150	112,0	2901283500
D400	600	760	640	680	150	145,0	2901284500

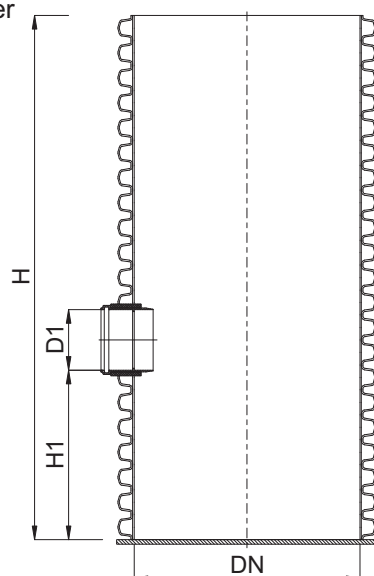
Gully grating



	DN [mm]	DN 1 [mm]	D1 [mm]	H [mm]	Weight [kg]	index -
D400	600	750	680	100	119,0	2902284500

Sewer manhole

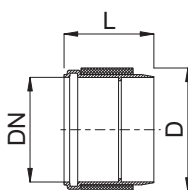
with a sedimentation tank for stormwater



DN	DN 1 [mm]	D1 [mm]	H * [mm]	H1 [mm]	Weight [kg]	index -
600	683	160	2000	500	40,9	2818120200
600	683	200	2000	500	41,7	2818130200

* other manhole heights available on request

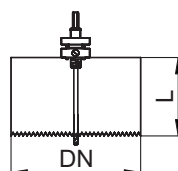
"In situ" gasket



DN	D1 [mm]	L [mm]	Weight [kg]	index -
110	138	120	0,5	5168201010
160	177	120	0,8	5168231010
200	226	120	1,6	5168251010

Hole cutter

Cutter holder – all-purpose



DN	D1 [mm]	L [mm]	Weight [kg]	index
110	138	90	0,8	5191201100
160	177	90	1,2	5191231100
200	226	90	1,7	5191252100
uniwersalny	-	-	0,6	5191000100

Installation instructions

DIAMIR inspection chambers should be installed in conditions specified in the technical design. The ground around chambers (0,3 m) should be composed of compactable soil, approved for use in road construction according to standard PN-S-02205:1998. Earthworks should be carried out in accordance with standard PN-EN 1610: 2002/Ap1:2007. Soil compaction should be performed in layers as specified in standard PN-ENV 1046:2007 to prevent from excessive ovalisation of a chamber cross-section.



1 Prepare a trench in an inspection chamber location removing large and sharp-edged stones. On the trench bottom prepare bedding composed of compactable soil, preferably sand (coarse- medium- or fine-grained) of minimum 10 cm thickness. An inspection chamber zone should include an area of at least a 30 cm wide strip around the chamber.



2 Place a base unit on a prepared earlier sand bedding and level it and then connect sewage pipes to the chamber.



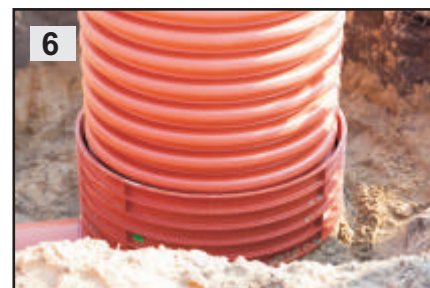
3 Fill up the trench with preliminary backfill (10 cm above the pipe level). Compaction should be performed manually, in layers every 15 cm or with light mechanical equipment (each layer up to 30 cm). Base unit socket 600 should protrude above the backfill level.



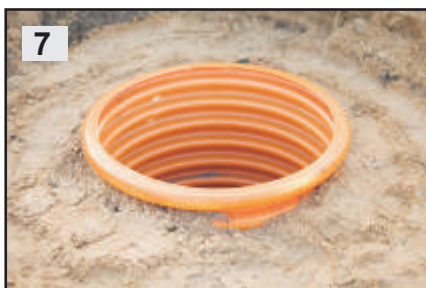
4 Prepare a corrugated riser pipe of the required length. The pipe can be cut to the required chamber height. Install a gasket in the lowest groove on the outside of the riser pipe. The gasket is delivered along with a base unit.



5 Lubricant should be applied on the inner side of a base unit socket 600 and gasket. Products approved for rubber gaskets and plastic should be used.



6 Insert a riser pipe with an installed gasket 600 into a base unit.



7 Compact the area around the pipe. Compaction should be performed manually, in layers every 15 cm or with light mechanical equipment (each layer up to 30 cm) in open areas to at least 90% of the Proctor compaction test and for inspection chambers located in a carriageway or road shoulder backfill should meet the requirements specified for compaction index resulting from the installation depth, road construction type (cutting, embankment) or traffic intensity category.



8 For inspection chambers equipped with riser pipes connected with telescope pipes with a cuff gasket, ensure a telescope pipe is inserted into a riser pipe to the depth of approximately 20 cm.

Chamber tops

Location of a DIAMIR chamber and expected load caused by traffic are the basis for selection of riser and telescope pipe stiffness and a choice of cast iron covers.

Depending on the chamber location within a ROW and a traffic intensity category, different manhole/gully tops are used, also construction requirements and top type which are classified into the following groups may differ.

Group 1 - Class A15 - green areas intended solely for pedestrians and pedal cyclists

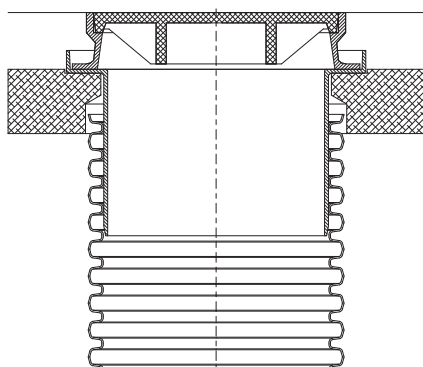
Group 2 - Class B125 - Roads and areas for pedestrians, and comparable areas, parking lots or places where cars are parked

Group 3 - Class C250 - Applies solely do sewer gully tops installed in the area of kerbside channels of roads and road shoulders

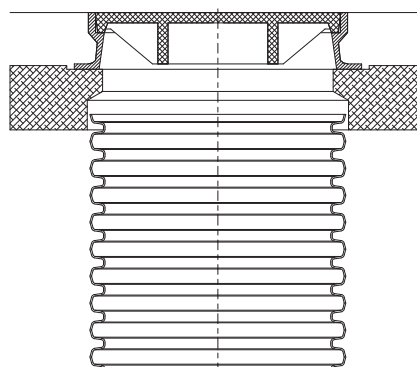
Group 4 - Class D400 - Carriageways of roads (including pedestrian streets) hard shoulders, and parking areas for all types of road vehicles

There are different rules of the manhole/gully top support depending on their type and class, and soil conditions. A manhole/gully top should sit on a reinforced concrete slab which is supported by an appropriately constructed load bearing structure adapted to loads caused by traffic. That may be reinforced bedding made of well compacted soil or a precast load-relieving slab made of reinforced concrete. For very heavy load caused by traffic or doubts about compaction of soil constituting top base, a slab should be based on B30 concrete ring of minimum height of 20 cm cast on the building site

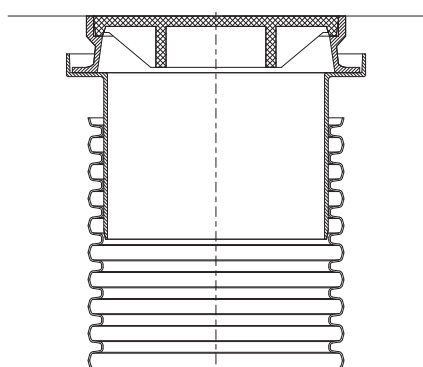
Cast iron chamber cover 600
Telescope adapter 600
Load bearing concrete ring 600



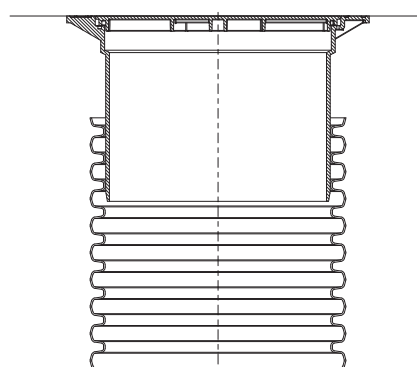
Cast iron chamber cover 600
Load bearing concrete ring 600



Cast iron chamber cover 600
Telescope adapter 600



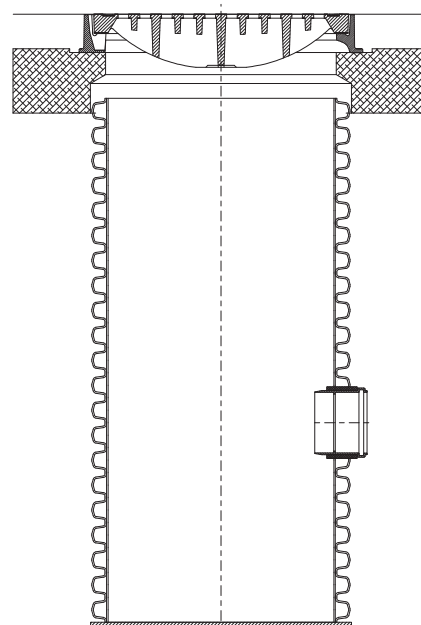
PP Telescope cover 600



Catch basins 600

A catch basin is constructed using a corrugated riser pipe DN 315, 425 or plain wall pipe 400. A pre-blinded pipe of appropriate length should be ordered, it may be also blinded on a building site. A tight basin bottom blinds the pipe. For stormwater chambers, a top is a cast iron grating mounted on a telescope pipe. For a drainage chambers all other tops specified in the catalogue of DIAMIR manholes/chambers are applied. They are used depending on the existing loads and investor preferences. In a riser pipe holes are made to construct appropriate outlets or inlets. Appropriate in-situ gasket should be installed in the holes. Insert in-situ gasket depends on the riser pipe used (single- or double-layer). See the Declaration of Conformity for details. In drainage chambers gaskets are mounted in situ and connectors are inserted to drainage pipes.

Note: There are precast drainage and storm water chambers available.



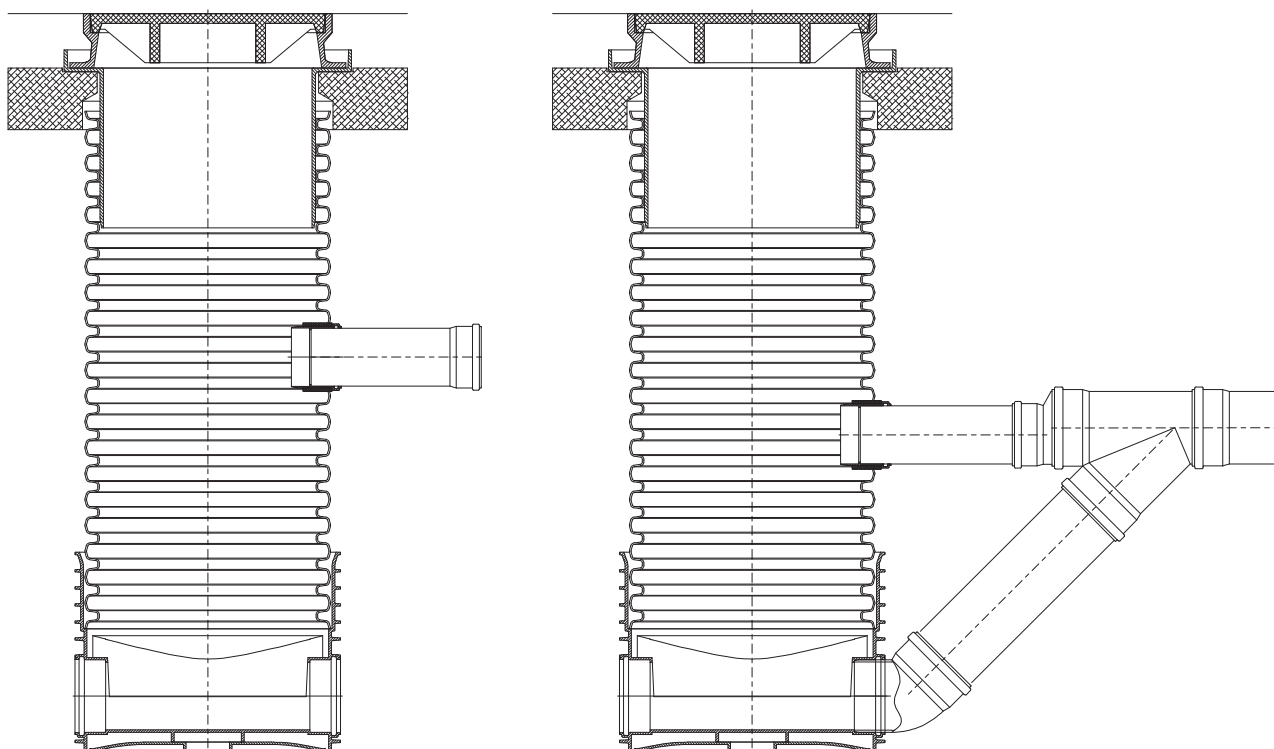
Backdrop manholes

Sometimes it is necessary to connect a channel to a manhole above a base unit.

Then, a so called backdrop manhole is constructed. According to standard PN-B-10729 "backdrop manholes in channels of diameters up to 0.40 m and drop height from 0,5 - 4,0 m may be constructed with a backdrop pipe placed inside or outside of a manhole. In a non-entry inspection chamber a drop pipe may be not installed.

That means that for non-entry inspection chambers, if a channel diameter does not exceed 160 mm, connection may be made through a hole in a riser pipe.

Appropriate in-situ gaskets are installed in the hole. If a channel is a K2-Kan structured pipe, a special fitting (adapter to a PVC socket) should be inserted into the in situ gasket. A backdrop pipe is not used. However, if a channel diameter exceeds 200 mm, a backdrop pipe has to be used and it should be connected to a chamber base unit. A T-branch connection is fitted to the channel. One of T-branches is connected to the backdrop pipe and the second one (after diameter reduction to 60 mm) is connected to a riser pipe (hole with an in situ gasket).



Technical features

Entry manholes **DIAMIR 1000**

Main components of a chamber

-base unit, a base of an entry manhole, allowing for direct connection of storm water drainage or sanitary sewer systems installed in the ground, including incorporated channels with possible branches along with possible branches

-shaft, a chamber built of modular PP sections, of the internal diameter 1000, equipped with access steps

-reduction cone PP 1000/600 allowing for adjustment of the manhole height. The cone is equipped with access steps

Standards:

-DIAMIR 1000 inspection chamber is compliant with

PN-EN 13598-2:2009

PN-EN 476:2011

-approval for use in road ROWs

Technical Approval **IBDIM AT/2010-02-2830**

Technical approval **IK AT/07-2011-0242-00**

Technical Approval **IBDIM AT/2011-02-2706**

-GIG (Central Mining Institute) Opinion approving their use in the areas of mining damages up to the 4th category

-Chemical resistance of chamber PP components to chemical substances is compliant with

the ISO/TR 10358 Guidelines

-Gully tops and manhole tops meet the requirements of standard

PN-EN 124:2000

-manhole steps meet the requirements of standard

PN-EN 13101:2005

-Seals meet the requirements of standard

PN-EN 681-1:2002

-Chemical resistance of elastomeric seals to chemical substances is compliant with

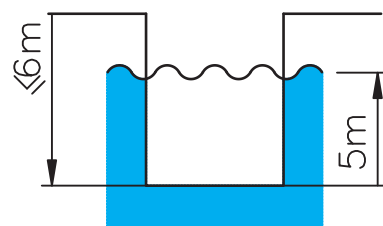
the ISO/TR 7620 Guidelines

Usage:

-maximum installation depth 6 m

-acceptable ground water table 5 m

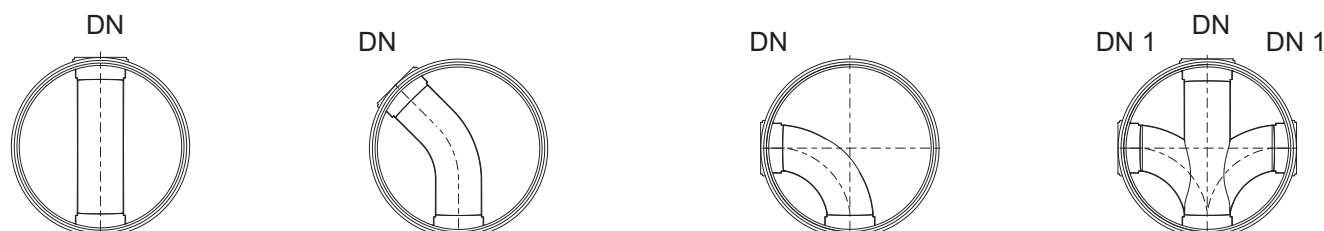
-acceptable load caused by traffic SLW60 according to ATV-A127P



Technical features

Technical data

Base units are made of polypropylene, with reinforcing ribs. They are adapted to connection with vertical riser pipes. There is a horizontal channel in the base unit with one or a few inlet connector pipes and one outlet connector pipe ending with bells for connection with plain wall pipes made of PVC-U, PP or PE or connector pipes adapted to connection with structural pipes K2-KAN.



Type 1 0°	Type 1 15°	Type 1 30°	Type 1 45°	Type 1 90°	Type 2 45° 90°		
DN	DN	DN	DN	DN	DN 1	DN	DN 1
200	200	200	200	200	200	200	200
250	250	250	250	250	250	250	250
315	315	315	315	315	315	315	315
400	400	400	400	400	400	400	400
500	500	500	500	-	-	-	-
200K2-Kan	200K2-Kan	200K2-Kan	200K2-Kan	200K2-Kan	200K2-Kan	200K2-Kan	200K2-Kan
250K2-Kan	250K2-Kan	250K2-Kan	250K2-Kan	250K2-Kan	250K2-Kan	250K2-Kan	250K2-Kan
300K2-Kan	300K2-Kan	300K2-Kan	300K2-Kan	300K2-Kan	300K2-Kan	300K2-Kan	300K2-Kan
400K2-Kan	400K2-Kan	400K2-Kan	400K2-Kan	400K2-Kan	400K2-Kan	400K2-Kan	400K2-Kan
500K2-Kan	500K2-Kan	500K2-Kan	500K2-Kan	-	-	-	-
600K2-Kan	600K2-Kan	600K2-Kan	-	-	-	-	-

A ball-and-socket joints $\pm 7,5^\circ$ may be used in connection bells 160; 200; 250; 315 (page 28)

Height adjustment

Entry manholes DIAMIR 1000

Specifications and height adjustment

Preparing specifications for materials required for an investment, total numbers of individual inspection chamber components should be indicated:

-base units, -riser pipes, -tops

The input parameter is chamber height specified in the design – the distance between the ground level and the chamber invert (base unit level). We label it as **Hs**.

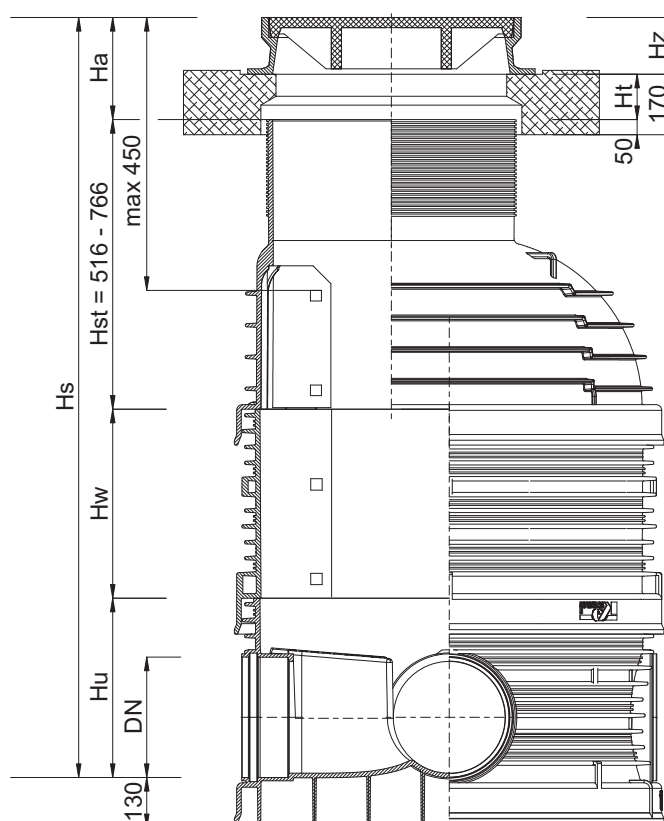
In order to make calculations easier, there is useful height (**Hu**) specified for each base unit type, that is, the distance between the bottom of a base unit and the bottom of base unit bell in which a riser pipe is installed.

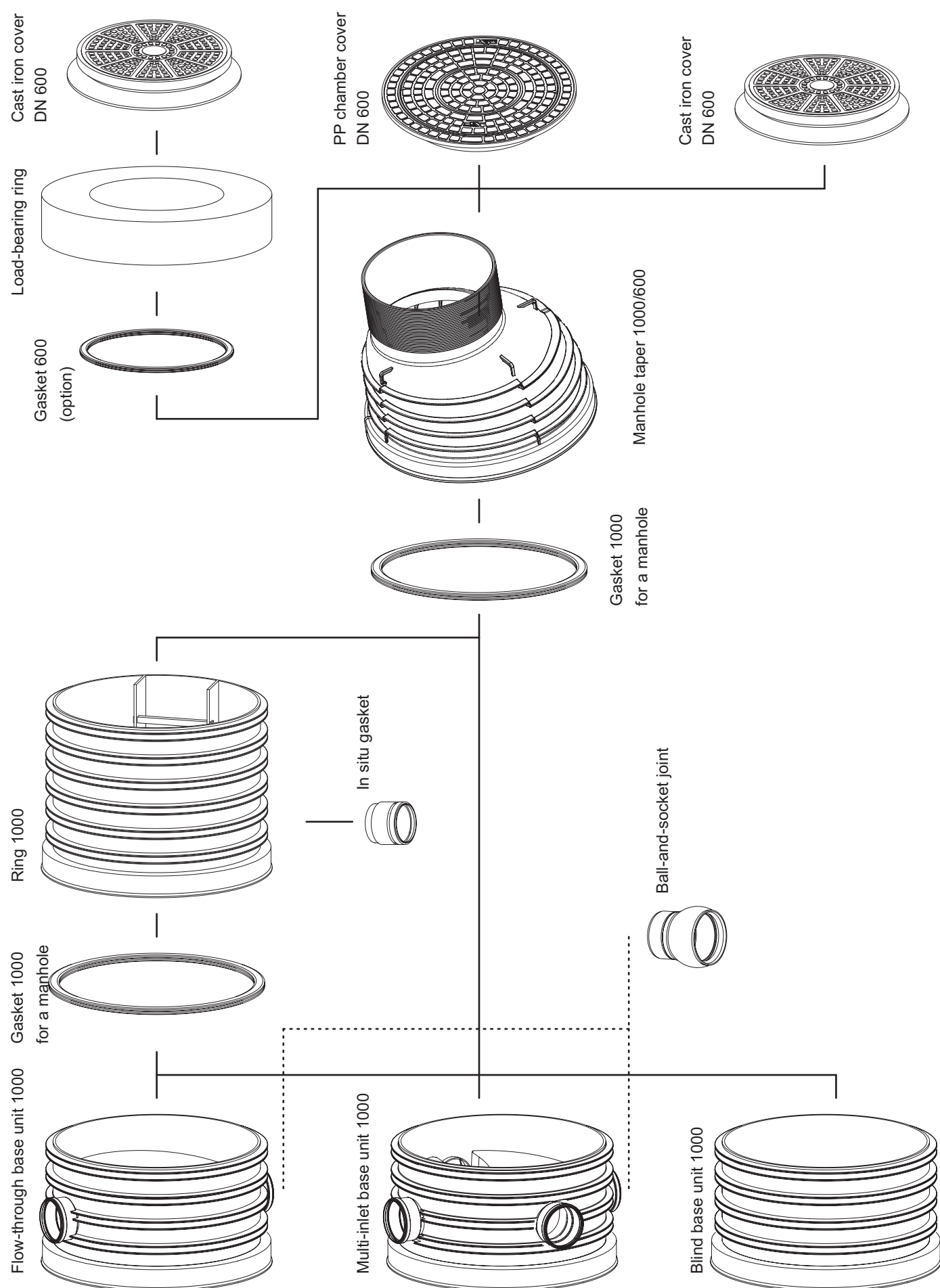
For calculations, we label the height of vertical chamber sections as **Hw**. Taper height will be **Hst**. The effective height of a top section (telescope) will be **Ha**.

Entry manhole DIAMIR 1000

Hs = Hu + Hw + Hst + Ha

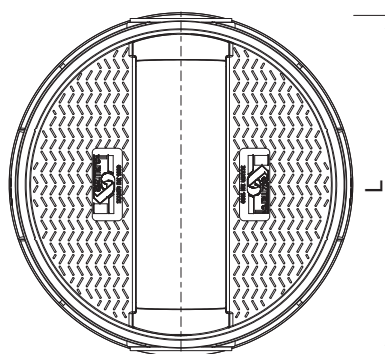
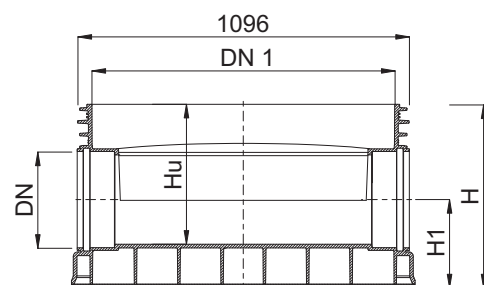
Ha = Ht + Hz





Flow-through base unit 1000

Type 1

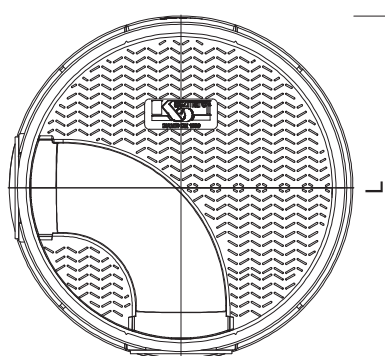
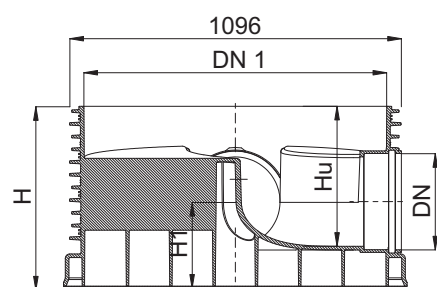


DN [mm]	DN 1 [mm]	H [mm]	Hu [mm]	H1 [mm]	L [mm]	Weight [kg]	index -
200	1000	595	444	252	1136	73,4	2631130030
250	1000	595	460	260	1136	76,4	2631140030
315	1000	595	475	280	1136	76,4	2631150030
400	1000	595	496	300	1440	91,6	2631160030
500	1000	845	665	440	1496	94,5	2631170030
200 K2 *	1000	595	438	259	1230	73,4	2631530030
250 K2 *	1000	595	432	291	1272	76,4	2631540030
300 K2 *	1000	595	435	320	1320	76,4	2631550030
400 K2 *	1000	595	495	382	1430	93,1	2631560030
500 K2 *	1000	845	658	440	1516	94,8	2631570030
600 K2 *	1000	845	665	498	1576	123,5	2631580030

* no gaskets in connection bells

Flow-through base unit 1000

Type 1

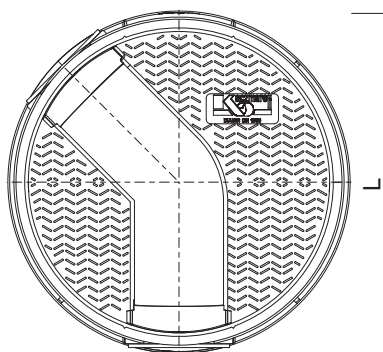
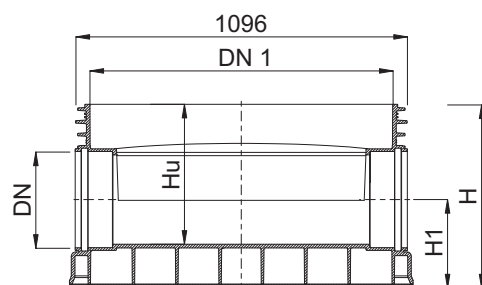


DN [mm]	DN 1 [mm]	H [mm]	Hu [mm]	H1 [mm]	L [mm]	Weight [kg]	index -
200x90°	1000	595	444	252	1136	73,8	2631139030
250x90°	1000	595	460	260	1136	76,8	2631149030
315x90°	1000	595	475	280	1136	76,4	2631159030
400x90°	1000	595	496	300	1440	91,6	2631169030
200K2-90° *	1000	595	444	252	1136	52,2	2631539030
250K2-90° *	1000	595	460	260	1136	55,0	2631549030
300K2-90° *	1000	595	475	280	1136	57,5	2631559030
400K2-90° *	1000	595	496	300	1440	91,6	2631569030

* no gaskets in connection bells

Flow-through base unit 1000

Type 1

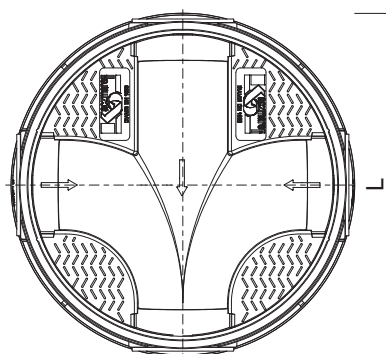
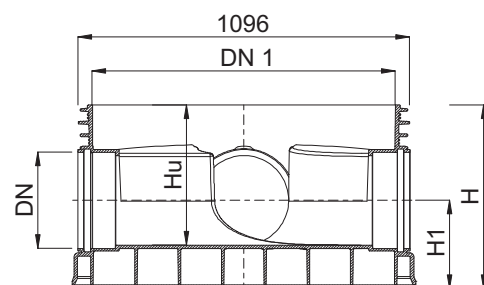


DN [mm]	DN 1 [mm]	H [mm]	Hu [mm]	H1 [mm]	L [mm]	Weight [kg]	index -
200x15°	1000	595	444	252	1136	73,8	2631131530
250x15°	1000	595	460	260	1136	76,8	2631141530
315x15°	1000	595	475	280	1136	76,4	2631151530
400x15°	1000	595	496	300	1440	91,6	2631161530
500x15°	1000	845	665	440	1496	94,5	2631161530
200K2-15° *	1000	595	444	252	1136	52,2	2631531530
250K2-15° *	1000	595	460	260	1136	55,0	2631541530
300K2-15° *	1000	595	475	280	1136	57,5	2631551530
400K2-15° *	1000	595	496	300	1440	91,6	2631561530
500K2-15° *	1000	845	658	440	1430	94,8	2631561530
600K2-15° *	1000	845	665	498	1516	123,5	2631561530
200x30°	1000	595	444	252	1136	73,8	2631133030
250x30°	1000	595	460	260	1136	76,8	2631143030
315x30°	1000	595	475	280	1136	76,4	2631153030
400x30°	1000	595	496	300	1440	91,6	2631163030
500x30°	1000	845	665	440	1496	94,5	2631163030
200K2-30° *	1000	595	444	252	1136	52,2	2631533030
250K2-30° *	1000	595	460	260	1136	55,0	2631543030
300K2-30° *	1000	595	475	280	1136	57,5	2631553030
400K2-30° *	1000	595	496	300	1440	91,6	2631563030
500K2-30° *	1000	845	658	440	1430	94,8	2631563030
600K2-30° *	1000	845	665	498	1516	123,5	2631563030
200x45°	1000	595	444	252	1136	73,8	2631134530
250x45°	1000	595	460	260	1136	76,8	2631144530
315x45°	1000	595	475	280	1136	76,4	2631154530
400x45°	1000	595	496	300	1440	91,6	2631164530
500x45°	1000	845	665	440	1496	94,5	2631164530
200K2-45° *	1000	595	444	252	1136	52,2	2631534530
250K2-45° *	1000	595	460	260	1136	55,0	2631544530
300K2-45° *	1000	595	475	280	1136	57,5	2631554530
400K2-45° *	1000	595	496	300	1440	91,6	2631564530
500K2-45° *	1000	845	658	440	1430	94,8	2631564530

* no gaskets in connection bells

Multi-inlet base unit 1000

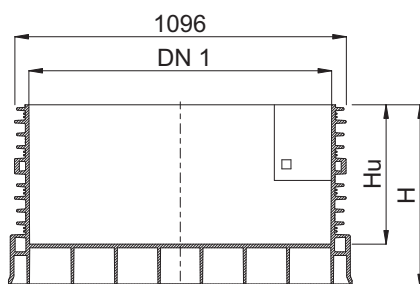
Type 2



DN [mm]	DN 1 [mm]	H [mm]	Hu [mm]	H1 [mm]	L [mm]	Weight [kg]	index -
200	1000	595	444	252	1136	52,9	2632139030
250	1000	595	460	260	1136	56,3	2632149030
315	1000	595	475	280	1136	59,3	2632159030
400	1000	595	496	300	1440	95,6	2632169030
500	1000	845	705	440	1496	101,3	2632179030
200 K2 *	1000	595	438	259	1230	53,3	2632539030
250 K2 *	1000	595	432	291	1272	57,1	2632549030
300 K2 *	1000	595	435	320	1320	60,2	2632559030
400 K2 *	1000	595	495	382	1430	97,7	2632569030
500 K2 *	1000	845	705	440	1516	103,4	2632579030

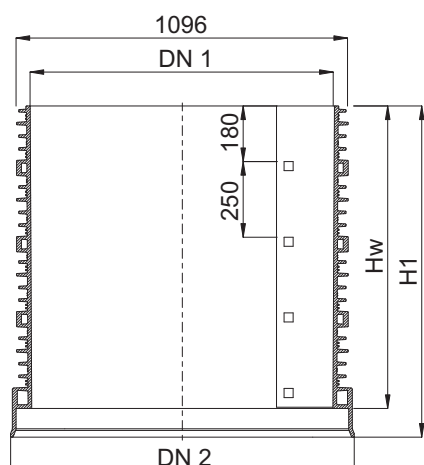
* no gaskets in connection bells

Blind base unit 1000



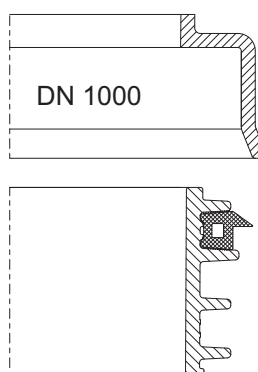
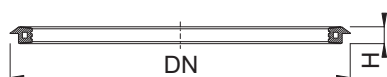
DN 1 [mm]	H [mm]	Hu [mm]	Weight [kg]	index -
1000	595	480	66,0	2630040030
1000	1095	980	82,5	2630080030

Ring 1000



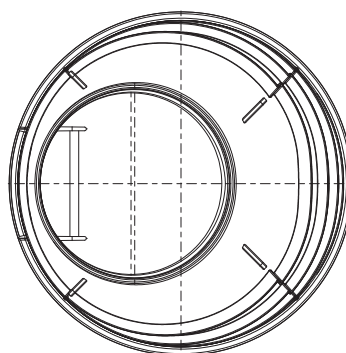
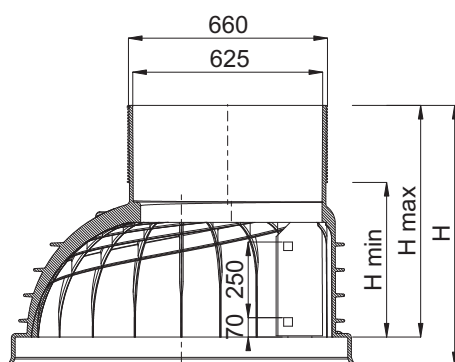
Hw [mm]	H1 [mm]	DN 1 [mm]	DN 2 [mm]	Weight [kg]	index -
250	345	1000	1136	21,0	2639120030
500	595	1000	1136	36,0	2639140030
750	845	1000	1136	52,5	2639160030
1000	1095	1000	1136	68,0	2639180030

Manhole gasket 1000



DN [mm]	H [mm]	Weight [kg]	index -
1000	30	3,8	5161231010

Manhole taper 1000

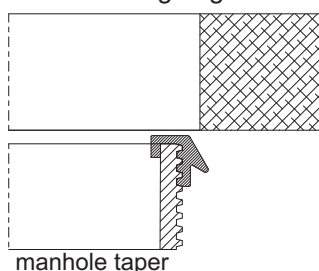


DN [mm]	DN 2 [mm]	H min [mm]	H max [mm]	H [mm]	Weight [kg]	index -
1000/625	1100	516	766	861	43,0	2639220030

Manhole gasket 1000/600 for a manhole taper

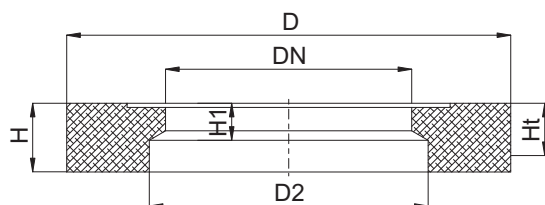


Load-bearing ring



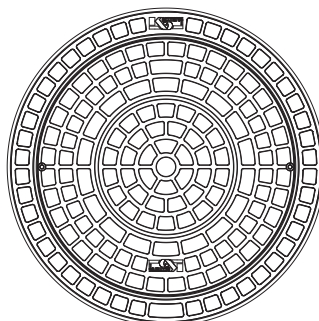
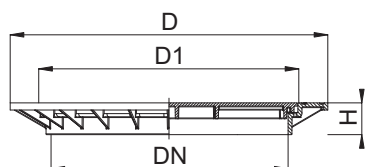
DN [mm]	H [mm]	Weight [kg]	index -
1000	30	2,1	5164181010

Load-bearing ring



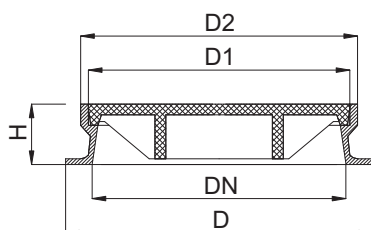
DN [mm]	D [mm]	D2 [mm]	H [mm]	H1 [mm]	Ht [mm]	Weight [kg]	index -
600	1100	690	170	90	120	220,0	2953184000

PP chamber cover DN 600



	DN [mm]	D [mm]	D1 [mm]	H [mm]	Weight [kg]	index -
A15	600	800	650	80	8,4	2589421090

Cast iron chamber cover DN 600



	DN [mm]	DN 1 [mm]	D1 [mm]	D2 [mm]	H [mm]	Weight [kg]	index -
A15	600	680	630	670	50	35,9	2901281500
B125	600	750	640	680	150	103,5	2901282500
C250	600	750	640	680	150	112,0	2901283500
D400	600	760	640	680	150	145,0	2901284500
D400 Gully grating	600	750	680	710	100	119,0	2902284500

Installation instructions

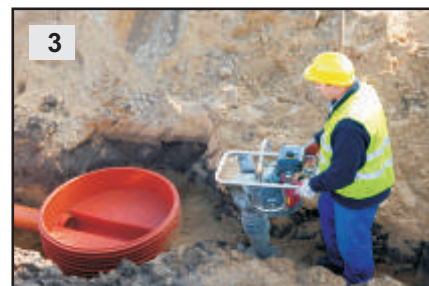
DIAMIR inspection chambers should be installed in conditions specified in the technical design. The ground around chambers (0,3 m) should be composed of compactable soil, approved for use in road construction according to standard PN-S-02205:1998. Earthworks should be carried out in accordance with standard PN-EN 1610:2002/Ap1:2007. Soil compaction should be performed in layers as specified in standard PN-ENV 1046:2007 to prevent from excessive ovalisation of a chamber cross-section.



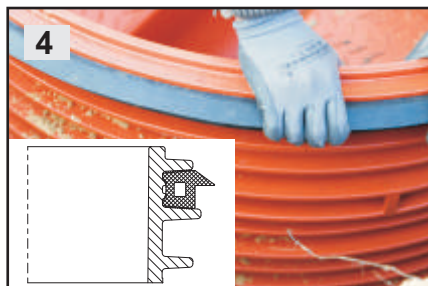
Prepare a trench in an inspection chamber location removing large and sharp-edged stones. On the trench bottom prepare bedding composed of compactable soil, preferably sand (coarse- medium- or fine-grained) of minimum 10 cm thickness. An inspection chamber zone should include an area of at least a 30 cm wide strip around the chamber.



Place a base unit on a prepared earlier sand bedding and level it and then connect sewage pipes to the chamber. A place where a manhole is located should be lowered by approximately 10 cm. Connect sewage pipes.



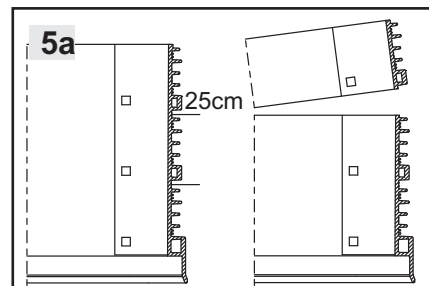
Fill up the trench with preliminary backfill (10 cm above the pipe level). Compaction should be performed manually, in layers every 15 cm or with light mechanical equipment (each layer up to 30 cm). Base unit 1000 should protrude above the backfill level.



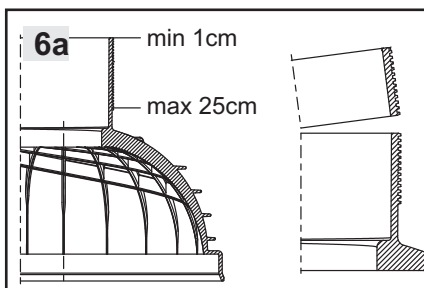
Install a gasket Ø1000 in the lowest groove on the outside of the ring. The groove should be thoroughly cleaned before gasket installation.



Lubricant should be applied onto a gasket Ø1000 before jointing with another manhole section. Products approved for rubber gaskets and plastic should be used. Note! If there are no rings of diversified heights on a building site, rings of standard heights may be cut. Rings may be cut only at marked places every 25 cm.



A taper should be installed similarly to other manhole components (rings Ø1000). A cylindrical section of the taper (from the minimum of 1 to the maximum of 25 cm) may be cut to achieve the required manhole height.



Note! A gasket may be installed in the cylindrical taper section (between the taper and a concrete ring).



For shallow installations, taper 1000/600 may be connected directly to a base unit with no ring used.

Installation instructions



Compact the area around the pipe. Compaction should be performed manually, in layers every 15 cm or with light mechanical equipment (each layer up to 30 cm) in open areas to at least 90% of the Proctor compaction test and for inspection chambers located in a carriageway or road shoulder backfill should meet the requirements specified for compaction index resulting from the installation depth, road construction type (cutting, embankment) or traffic intensity category.

The manhole cover should be secured against shifting by means of anchoring or concreting.

Manhole tops

Location of a DIAMIR 1000 manhole and expected load caused by traffic are the basis for selection of riser and telescope pipe stiffness and a choice of cast iron covers.

Depending on the chamber location within a ROW and a traffic intensity category, different manhole/gully tops are used, also construction requirements and top type which are classified into the following groups may differ.

Group 1 - Class A15 - green areas intended solely for pedestrians and pedal cyclists

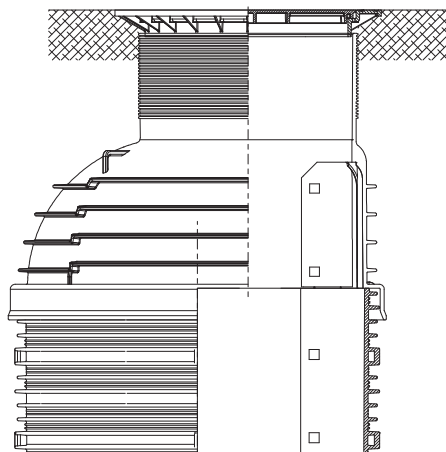
Group 2 - Class B125 - Roads and areas for pedestrians, and comparable areas, parking lots or places where cars are parked

Group 3 - Class C250 - Applies solely do sewer gully tops installed in the area of kerbside channels of roads and road shoulders

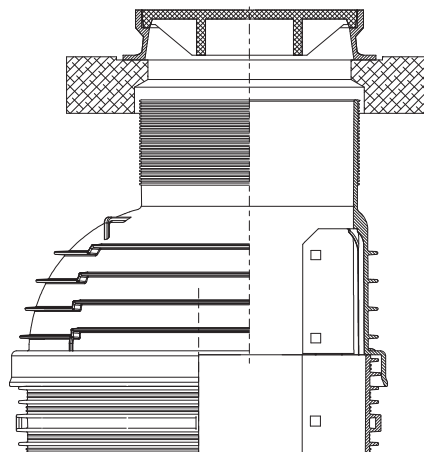
Group 4 - Class D400 - Carriageways of roads (including pedestrian streets) hard shoulders, and parking areas for all types of road vehicles

There are different rules of the manhole/gully top support depending on their type and class, and soil conditions. A manhole/gully top should sit on a reinforced concrete slab which is supported by an appropriately constructed load bearing structure adapted to loads caused by traffic. That may be reinforced bedding made of well compacted soil or a precast load-relieving slab made of reinforced concrete. For very heavy load caused by traffic or doubts about compaction of soil constituting the top base, a slab should be based on B30 concrete ring of minimum height of 20 cm cast on a building site

PP chamber cover DN 600



Cast iron cover DN 600



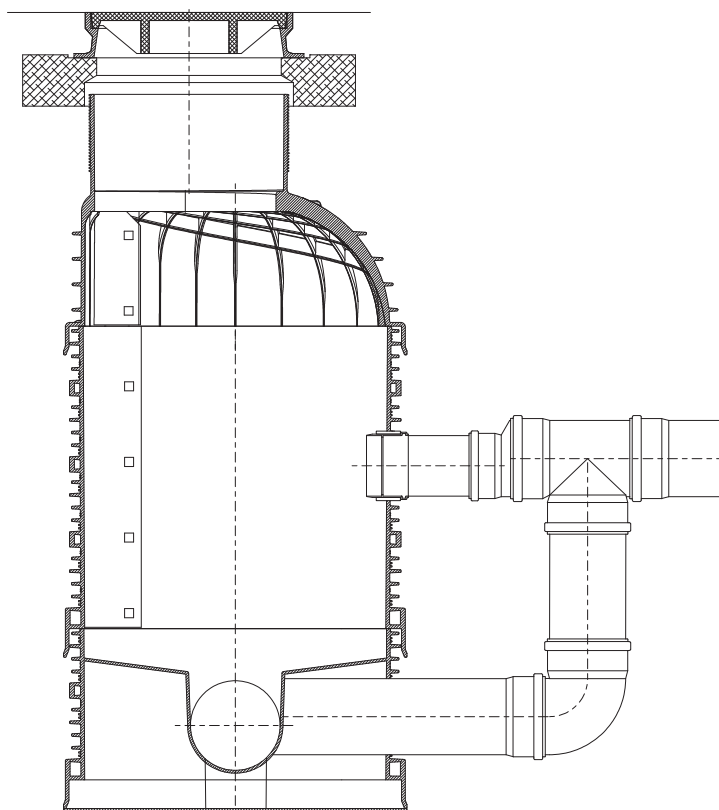
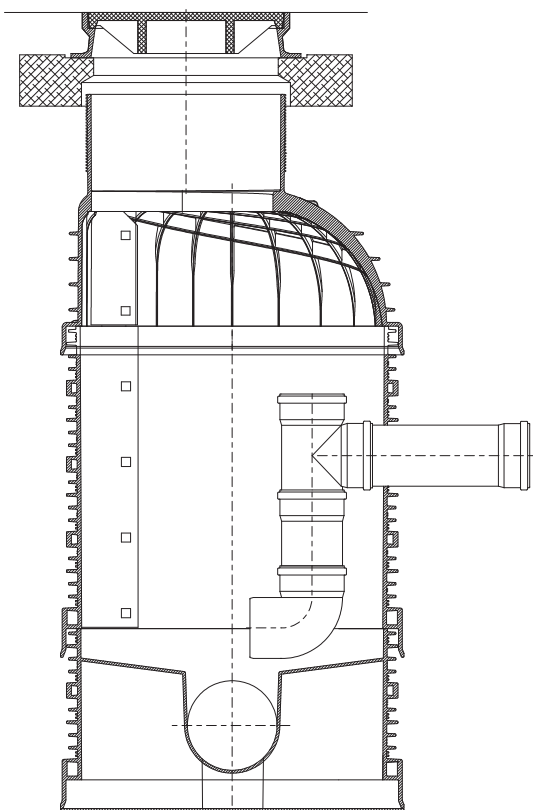
Backdrop manholes

Sometimes it is necessary to connect a channel to a manhole above a base unit.

Then, a so called backdrop manhole is constructed. According to standard PN-B-10729 "backdrop manholes in channels of diameters up to 0,40 m and drop height from 0,5 - 4,0 m may be constructed with a backdrop pipe placed inside or outside of a manhole. In a non-entry inspection chamber a drop pipe may be not installed.

That means that for non-entry inspection chambers, if a channel diameter does not exceed 160 mm, connection may be made through a hole in a riser pipe.

Appropriate in-situ gaskets are installed in the hole. If a channel is a K2-Kan structured pipe, a special fitting (adapter to a PVC socket) should be inserted into the in-situ gasket. A backdrop pipe is not used. However, if a channel diameter exceeds 200 mm, a backdrop pipe has to be used and it should be connected to a chamber base unit. A T-branch connection is fitted to the channel. One of T-connections is connected to the backdrop pipe and the second (after diameter reduction to 60 mm) is connected to a riser pipe (hole with an in-situ gasket).



Special manhole/inspection chambers **DIAMIR**

Sewer manholes/inspection chambers **DIAMIR** may be manufactured of polypropylene (PP), polyethylene (PE) or vinyl polychloride (PVC- U) on individual requests. Intended for construction of gravitational sewerage systems (sanitary, stormwater, combined sewage, industrial) and installation systems (water meters, fixtures, pump stations).

Variants on special manhole solutions

- sewerage flow-through and angular flow-through manhole/inspection chambers
- collecting sewerage wells;
- catch basins;
- discharge manholes, reducing sewer energy;
- chambers for installation systems (water meters, fixtures, etc.);
- underground reservoirs;

Ranges of manhole/chamber risers diameters:

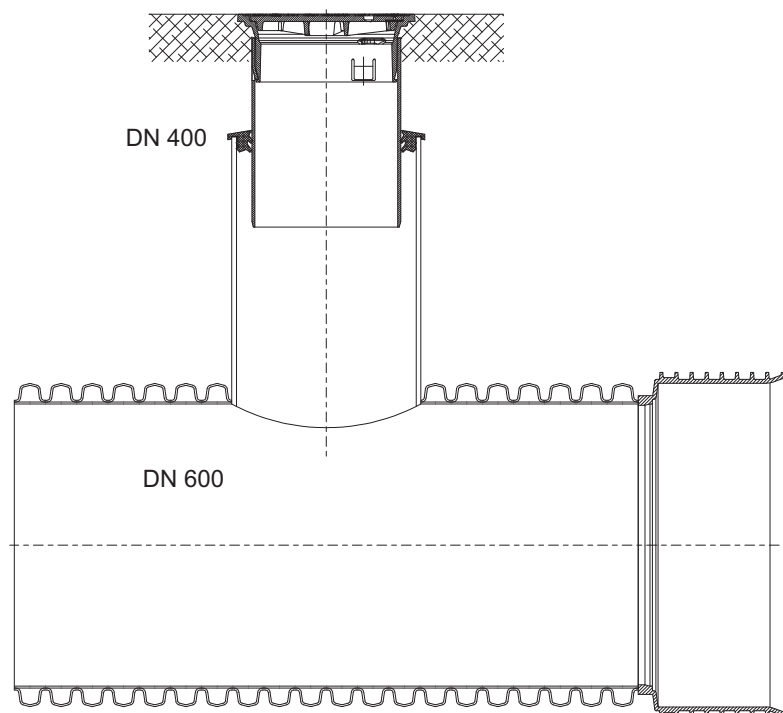
- of double-layer corrugated pipes from DN/ID300 to DN/ID 1000
- of single-layer corrugated pipes DN/ID425, DN/ID600
- of single-layer, plain-wall pipes DN/OD400

Ranges of diameters of connection sockets:

- plain-wall pipes from DN/OD110 DN/OD500
- K2 sewer pipes from DN/OD160 DN/OD1000

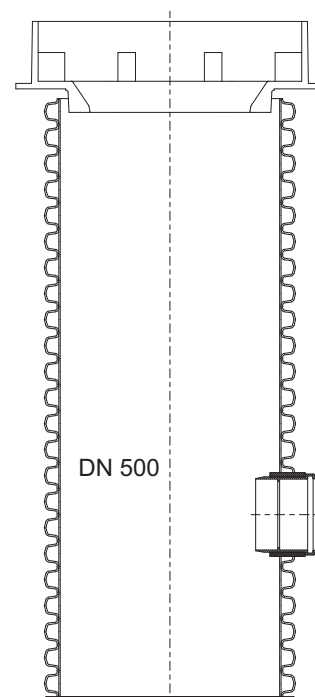
Flow-through manhole **DIAMIR 400**

- different options available: flow-through, angular flow-through, collecting;
- channel diameter up to DN 1000;
- flare or flareless stub pipes;



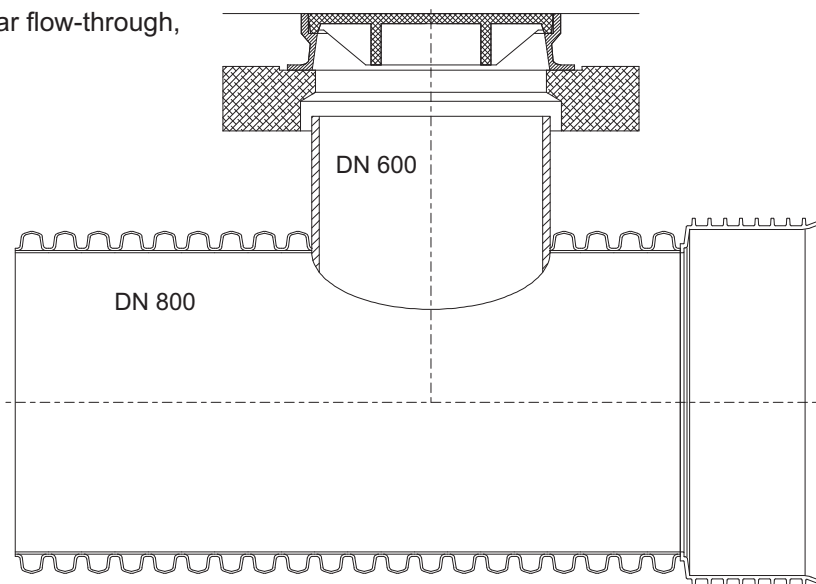
Catch basin with a sump 500

- riser diameter up to DN 1000;
- outlet diameter DN 110 - DN 200 (in-situ gasket);
- flare or flareless stub pipes;



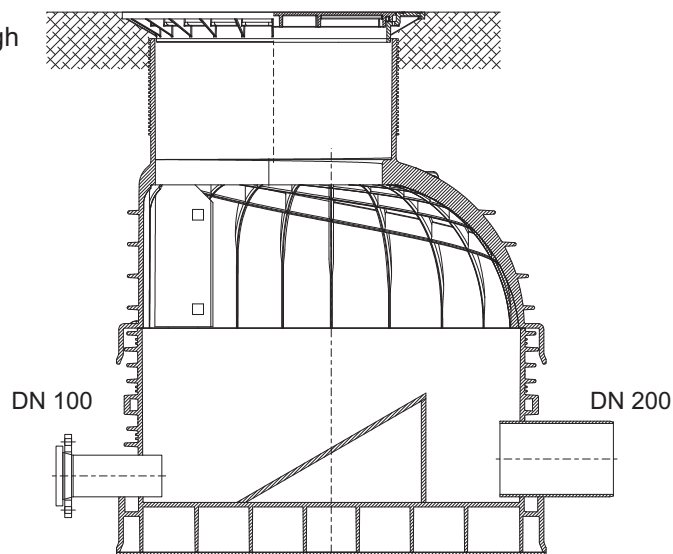
Flow-through manhole **DIAMIR 600**

- different options available: flow-through, angular flow-through, collecting
- channel diameter up to DN1000;
- flare or flareless stub pipes;

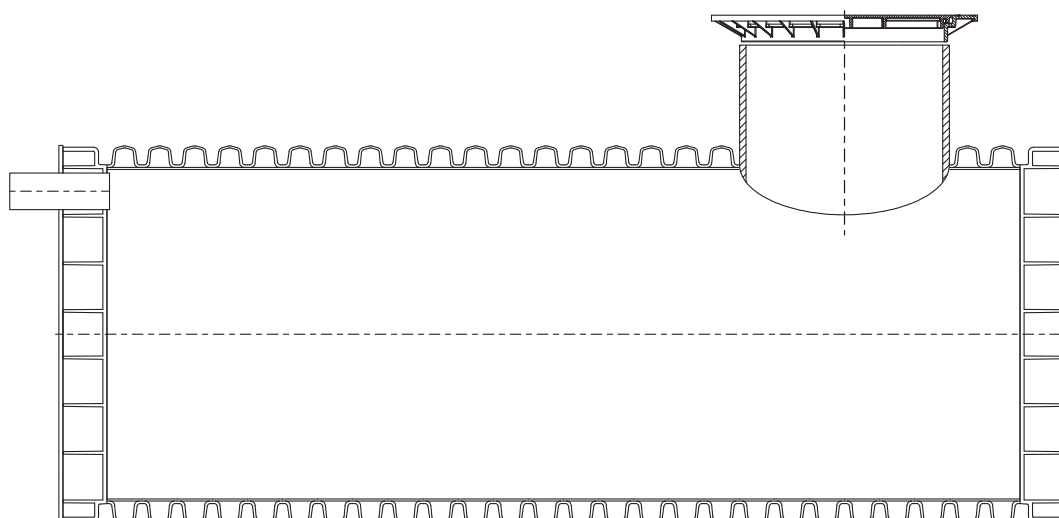


Discharge manhole **DIAMIR 1000**

- different options available: flow-through, angular flow-through
- flareless or flange inlet stub pipe
- flare or flareless outlet stub pipes;

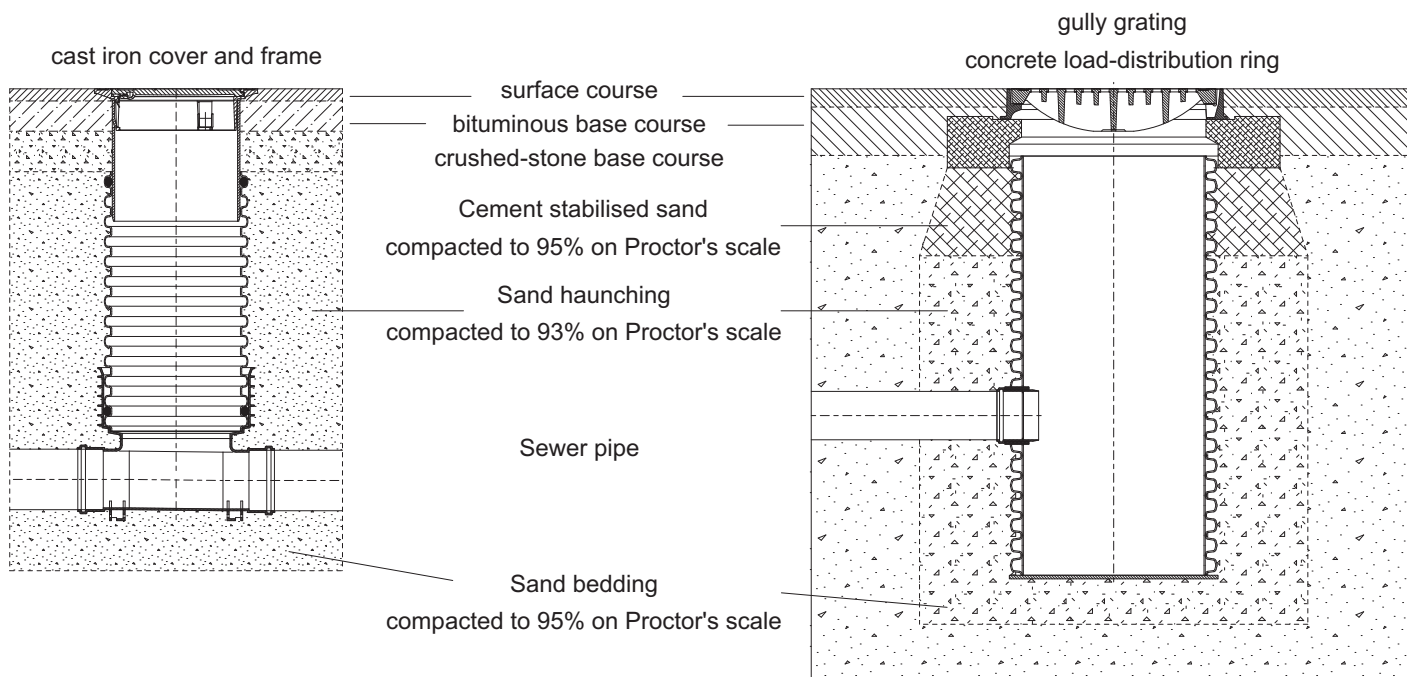


Horizontal tank



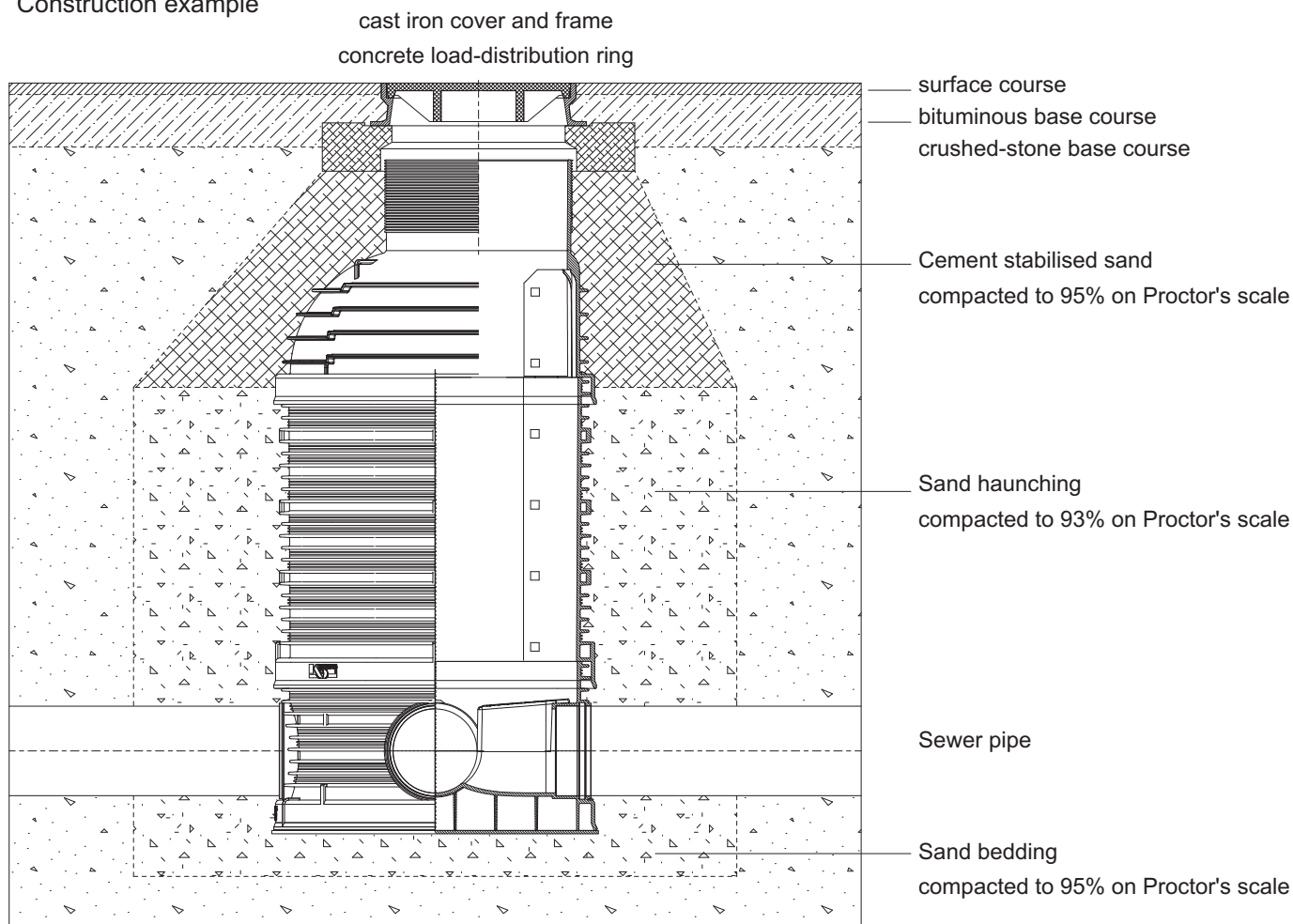
DIAMIR manhole

Construction example



DIAMIR 1000 manhole

Construction example



Contact details:

Company / contractor:

Building site:

tel.:

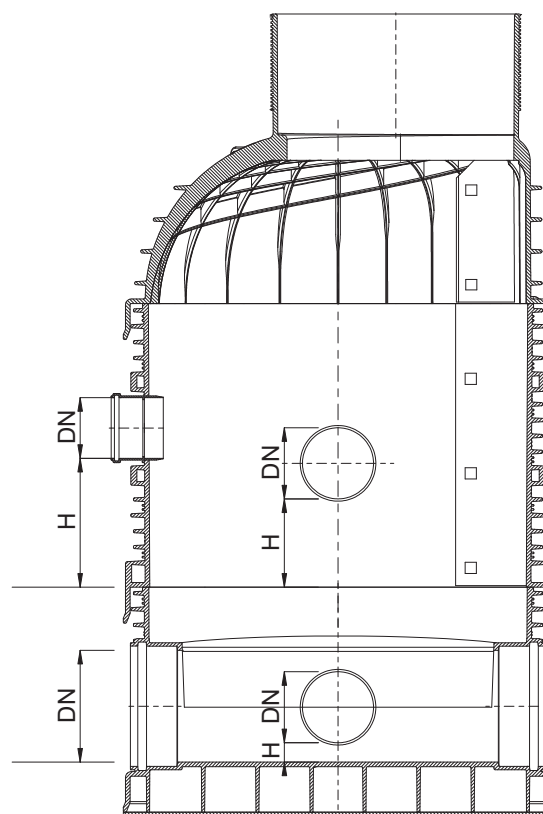
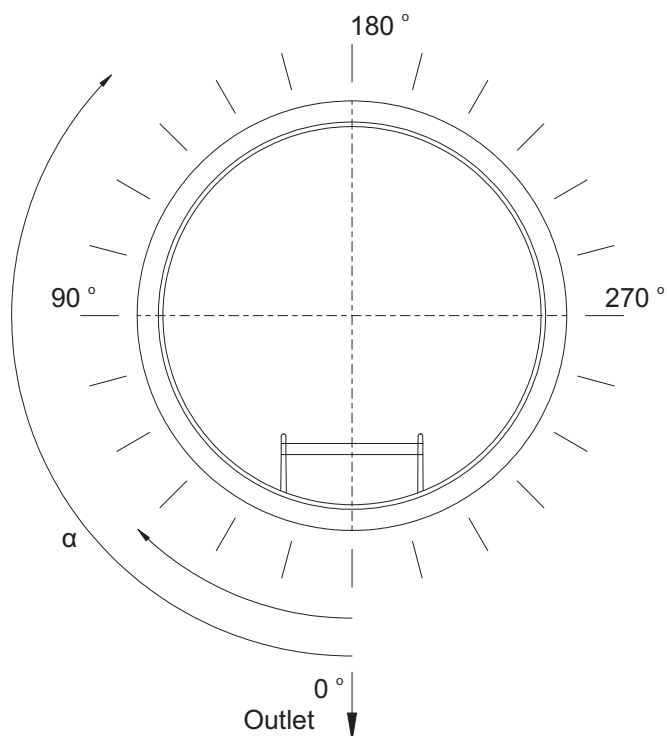
fax:

mobile:

delivery date:

Flow-through base unit 1000

with additional inlets



- | | | | |
|--|-------------------------------|--------------------------------|--------------------------------|
| ☐ Flow-through base unit DIAMIR 1000 with additional inlets | ☐ H500 | ☐ H1000 | |
| ☐ Blind base unit DIAMIR 1000 with additional inlets | ☐ H500 | ☐ H750 | ☐ H1000 |
| ☐ Ring DIAMIR 1000 with additional inlets | | | |

No.	DN	α	H	Inlet/Outlet slope (standard 0%)
-	[mm]	[°]	[mm]	%
Outlet		0°		
Inlet 1				
Inlet 2				
Inlet 3				
Inlet 4				

Notes:

- Distances are measured from the blind base unit invert or from the lowest point of a ring
- available diameters of sewerage plain-wall stump pipes 110; 160; 200; 250; 315; 400; 500
- available diameters of K2-Kan sewerage plain-wall stump pipes 160; 200; 250; 300; 400; 500

[illegible]



RELIABLE POLISH SYSTEMS



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