



OSMA[®] ***RV System***

ISSUED 07/2019



ISO 9001

- **WITHSTANDS SEVERE CONDITIONS**
- **MEETS FUTURE STANDARDS**
- **HIGH THERMAL AND CHEMICAL RESISTANCE**
- **LOW SEDIMENTATION RISK**
- **WEAR AND ABRASION RESISTANCE**
- **GREAT HYDRAULIC PROPERTIES**
- **HIGH STRENGTH**
- **ABILITY TO WITHSTAND WHEEL PRESSURE (USE IN GARDENS AS WELL AS FOR BUILDING HIGHWAYS)**
- **IDEAL CONNECTION TIGHTNESS**
- **WATER ZONE PROTECTION**
- **LOW SEDIMENTATION RISK**
- **MANHOLE DEPTH TO 4m**
- **EASY INSPECTION**
- **100% RECYCLABLE**
- **INCREASED WORK PRODUCTIVITY**

Manhole System of the Future

RV-System OSMA® is a modern, advanced manhole components system, intended for building inspection sewer manholes and inlets in extreme conditions. It was designed and developed according to the latest findings in the plastic mechanics field based on the requirements of contractors and engineer network operators.

Material – PP/PVC

Among thermoplastic materials, polypropylene (PP) has a special spot, considering its high thermal and chemical resistance and extraordinary resilience. Thanks to its excellent workability, a manhole bottom, which has a perfectly smooth interior wall that easily resists abrasions, sedimentation and outer ground pressure, can be constructed of this material. Non-tempered polyvinyl chloride (PVC-U) is considered to be an advanced and long approved material. The results are manhole tubes and telescopes with an inner wall resistant to abrasions and a resilient outer layer that offers resistance to all commonly used materials for packing and compaction.

Reinforced Structure

The advantage of these manhole bottoms are the reinforced ribbed walls withstanding earth pressure. The flexible joint system of the manhole tube with a telescopic extension tube, equipped with various cast-iron coverings, easily withstands wheel pressures up to 400 kN.

Multi-Bladed Sealing Element

When over-pressured as well as decompressed to 0.5 bar, a multi-bladed sealing element made from durable rubber provides system connection tightness.

An element equipped with wiping, restricting, fastening and the actual sealing edge is placed in a specially formed bell-mouth chamber. The unit thereby provides ideal connection tightness even in case of pipe deformation or deflection.

Wide Range of Products

RV-System OSMA® is a complete component system enabling manhole construction at various depths, with additional attachments of new drainage branches and the possibility to connect to various drainage systems.

Environmental Protection

During manufacturing, handling and assembly, RV-System OSMA® plastic manholes, thanks to their low weight, need less energy, produce less CO₂ and the assembly is faster compared to concrete or brick systems. In addition, the whole system is fully recyclable, thereby meeting strict environmental criteria.



RV-System OSMA®

Inspection Shafts

Description

Inspection manhole and street inlet bottoms made from polypropylene have a homogeneous wall with high circular stiffness and excel with high thermal resistance up to 90 °C.

Field of application

Bottoms are intended to be a base for the assembly of inspection manholes for residential sewage connections and storm inlets as part of rainwater sewers.

RV-System OSMA®

Shaft Tubes and Telescopes

Description

Manhole tubes and telescopes for inspection manholes and street inlets made from non-tempered polyvinyl chloride with TRIO technology have a structured wall with high radial stiffness and excellent wide chemical and thermal resistance to 90°C.

Field of application

Manhole tube and telescopes are intended for the assembly of inspection manholes for residential sewage connections and storm inlets as part of rainwater sewers.





RV-System OSMA® is formed of three basic building components from which any manhole for various usages can be put together.

These basic components are:

SHAFT BOTTOM

It is made of polypropylen (PP) in eight basic concepts with different numbers of water inlets. All inlets are supplied with a socket with multi-edged sealing ring. It is possible to cover unused inlets with the socket cap that is part of each drainage system. The excellent connection tightness of the manhole bottom joint with piping and manhole tube provides resistance to external water leaking into the body of the manhole (e.g. with high underground water levels around) or on the contrary, prevents groundwater contamination by domestic waste or sewage water.

SHAFT TUBE

It is a smooth tube made of polyvinylchlorid (PVC) in dimension line DN 400. It is provided in four lengths, regulated by the considered manhole depth. This saves time spent on pipe shortening while assembling – see the RV-System OSMA® Component Chart.

CAST-IRON TELESCOPE

It is the most variable system element that determines the final manhole function. The telescope is supplied in dimensional line DN 315 which fits the one size bigger manhole tube DN 400. Its top part is a closely placed cast-iron cap with load capacity 12.5t or 40 t, equipped with a tight cap, with ventilating hole or draught grill. An integral part of the telescope is a rubber sealing collar used for connection to the manhole tube.

EXAMPLE	
Required installation depth	1200 mm
Pipe dimension at the manhole outlet	DN 160
Pipe quantity and dimension at the manhole entry	1x DN 125, 1x DN 160
Requested cap type	cast-iron lid without ventilation – bearing 12,5 t

PROJECT	
Shaft bottom	RVD-PPL DN 400/160
Reduction	KGR 160/125
Socket stopper	KGM DN 160
Shaft tube	RVT DN 400/500 mm
Telescope	RVTEL 12,5 t

NEW SEALING ELEMENT

It is equipped with four functional blades (see picture):

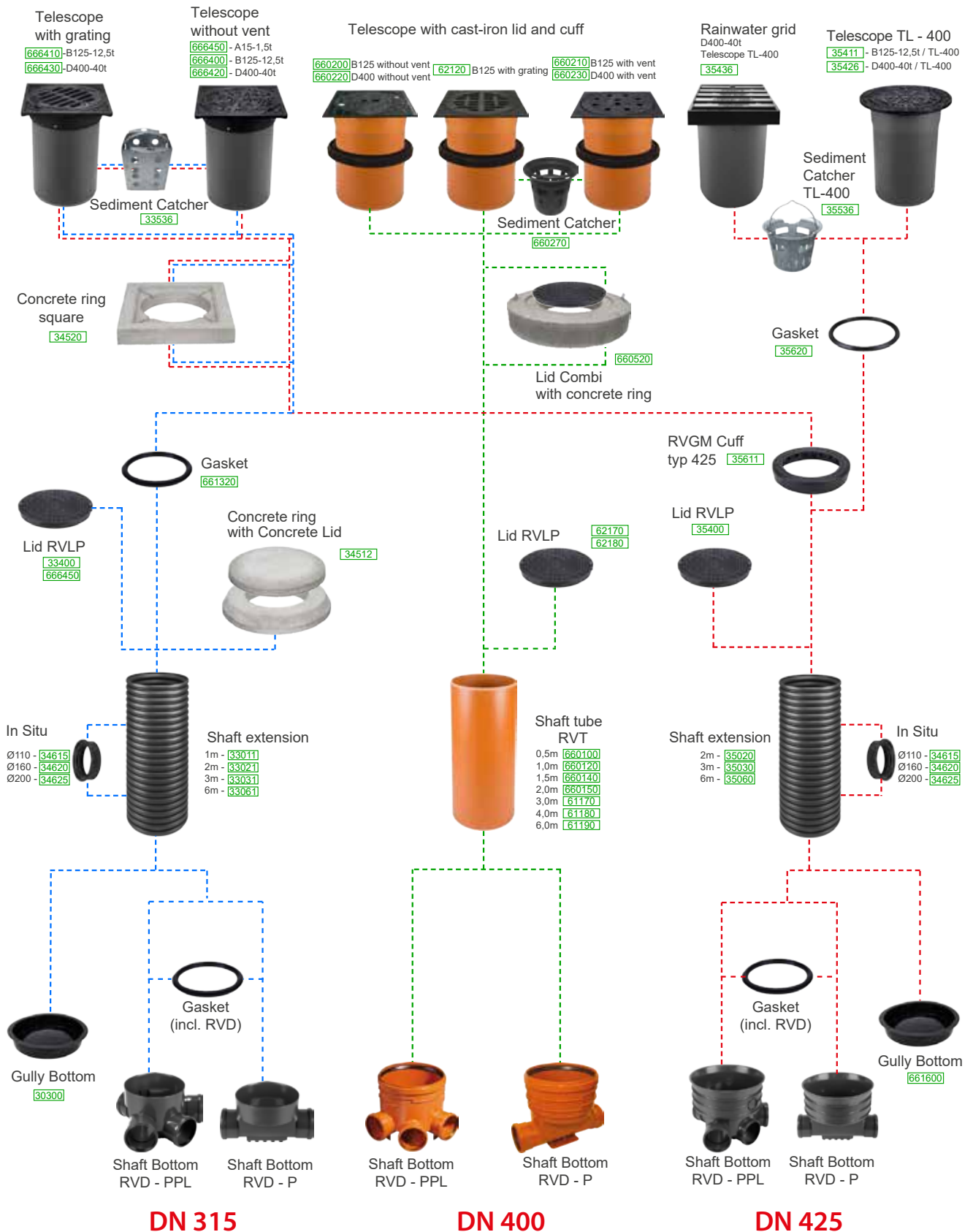


1. Tension blade inhibiting the infiltration of impurities between the seal and tube wall;
2. Restriction blade fixating position of the inserted tube;
3. Wiping blade removing residual impurities from the inserted tube end;
4. Main sealing blade providing long lasting connection tightness.



TRAFFICABLE LIDS (A15) CAST-IRON AND PLASTIC

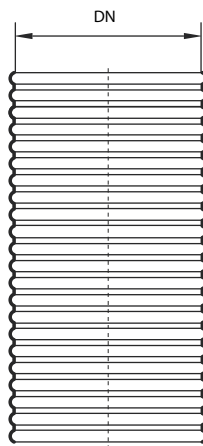
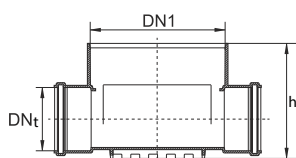
It is registered among RV-System OSMA® supplements since its assembly differs from the assembly of the manhole with a telescope. It is fitted right on the manhole tube shortened exactly to fit the depth of the ground. It is used mainly in open terrain and sand roads.



RV DN 315

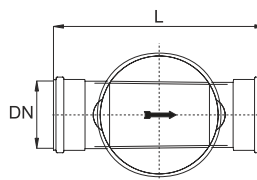
RVT – Shaft Tube DN 315 - Bellows

EAN CODE	EAN	l (mm)	PACKING	PALLETE
4025075330117	33011	1000	1	9
4025075330216	33021	2000	1	9
4025075330315	33031	3000	1	9
4025075330612	33061	6000	1	9



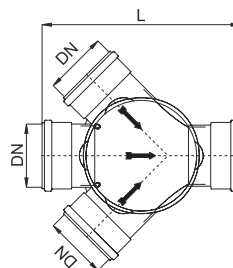
RVD-P – Shaft Bottom DN 315 (streight type)

EAN CODE	EAN	DNt	DN1	h (mm)	L (mm)	PACKING	PALLETE
4025075601002	33116	160	341	290	521	1	10
4025075601101	33216	200	341	336	513	1	10



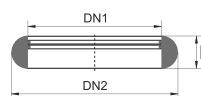
RVD-PPL – Shaft Bottom DN 315 (streight type, left, right)

EAN CODE	EAN	DNt	DN1	h (mm)	L (mm)	PACKING	PALLETE
4025075601200	33111	160	341	310	521	1	8
4025075601309	33211	200	341	356	513	1	8



Sealing for Telescope RVTEL

EAN CODE	EAN	DN1	DN2	h	PACKING	PALLETE
4052836613202	661320	292	342	26	1	-



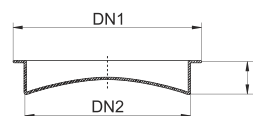
RVLP A15 OSMA – trafficable Lid

EAN CODE	EAN	MATERIAL	CAPACITY (t)	D (mm)	PACKING	PALLETE
4025075334009	33400	PLASTIC	1,5	360	1	6



Bottom of the Gully PP

EAN CODE	EAN	DN1	DN2	h	PACKING	PALLETE
4025075303005	30300	331	297	58	1	-



RVLP A15 – Telescope with trafficable Cast-iron Lid
(lid without ventilation)

EAN CODE	EAN	CAPACITY (t)	h (mm)	PACKING	PALLETE
4052836664501	666450	12,5	475	1	6



RVTEL B 125 –Telescope with Cast-iron Lid
(lid without ventilation)

EAN CODE	EAN	CAPACITY (t)	h (mm)	PACKING	PALLETE
4052836664006	666400	12,5	495	1	6



RVTEL B 125 –Telescope with Cast-iron Lid
(lid with grating)

EAN CODE	EAN	CAPACITY (t)	h (mm)	PACKING	PALLETE
4052836664105	666410	12,5	495	1	6



RVTEL D 400 –Telescope with Cast-iron Lid
(lid without ventilation)

EAN CODE	EAN	CAPACITY (t)	h (mm)	PACKING	PALLETE
4052836664204	666420	40	495	1	6



RVTEL D 400 –Telescope with Cast-iron Lid
(lid with grating)

EAN CODE	EAN	CAPACITY (t)	h (mm)	PACKING	PALLETE
4052836664303	666430	40	495	1	4



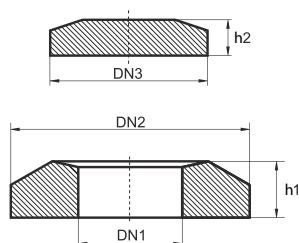
Sewage Basket

EAN CODE	EAN	PACKING	PALLETE
4025075335365	33536	1	-
4025075355363	35536	1	-



Concrete cone and cover for types 315 a 400

EAN CODE	EAN	DN1	DN2	DN3	h1	h2	PACKING	PALLETE
4025075345128	34512	410	700	640	110	70	1	4



RV DN 400

RVT – Shaft Tube DN 400

EAN CODE	EAN	l (mm)	PACKING	PALLETE
4052836601001	660100	500	1	6
4052836601209	660120	1000	1	6
4052836601407	660140	1500	1	6
4052836601506	660150	2000	1	6
4025075611704	61170	3000	1	6
4025075611803	61180	4000	1	6
4025075611902	61190	6000	1	6

RV – Shaft Tube

EAN CODE	EAN	l (mm)	PACKING	PALLETE
4025075611957	61195	6000	1	6
4025075611988	61198	6000	1	6
4052836119551	611955	6000	1	6

RVD-P – Shaft Bottom DN 400 (streight type)

EAN CODE	EAN	DNt	t (mm)	h (mm)	l (mm)	PACKING	PALLETE
4052836600004	660000	110	325	351	456	1	8
4052836600202	660020	160	325	432	590	1	8
4052836600400	660040	200	325	401	509	1	8
4025075601408	60140	250	325	530	710	1	8
2055075343254	34325	315	325	800	1080	1	8

RVD-PPL – Shaft Bottom DN 400 (streight type, left, right)

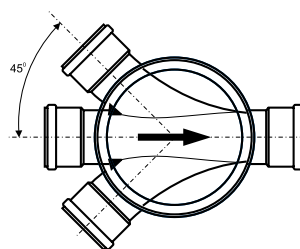
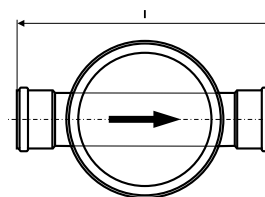
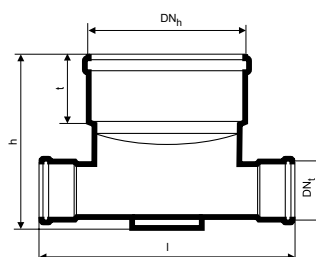
EAN CODE	EAN	DNt	t (mm)	h (mm)	l (mm)	PACKING	PALLETE
4052836600103	660010	110	325	352	456	1	8
4052836600301	660030	160	325	432	536	1	8
4052836600509	660050	200	325	402	509	1	8
4025075342202	34220	250	325	800	1130	1	8
4025075343110	34310	315	325	800	1080	1	8

RVGM – reducing Cuff for RVTEL

EAN CODE	EAN	DN ₁	DN ₂	PACKING	PALLETE
4052836603005	660300	400	315	1	-

RVLP A15 OSMA – trafficable Lid

EAN CODE	EAN	MATERIAL	CAPACITY (t)	D (mm)	PACKING	PALLETE
4025075621803	62180	PLASTIC	1,5	430	1	6
4025075621703	62170	CAST-IRON	1,5	430	1	6



RVTEL B 125 – Telescope with Cast-iron Lid and Cuff
(lid without ventilation)

EAN CODE	EAN	DN	CAPACITY (t)	h (mm)	PACKING	PALLETE
4052836602008	660200	300	12,5	610	1	6



RVTEL B 125 – Telescope with Cast-iron Lid and Cuff
(lid with ventilation)

EAN CODE	EAN	DN	CAPACITY (t)	h (mm)	PACKING	PALLETE
4052836602107	660210	300	12,5	610	1	6



RVTEL B 125 – Telescope with Cast-iron Lid and Cuff
(lid with grating)

EAN CODE	EAN	DN	CAPACITY (t)	h (mm)	PACKING	PALLETE
4052836602108	62120	300	12,5	610	1	6



RVTEL D 400 – Telescope with Cast-iron Lid and Cuff
(lid without ventilation)

EAN CODE	EAN	DN	CAPACITY (t)	h (mm)	PACKING	PALLETE
4052836602206	660220	300	40	610	1	4



RVTEL D 400 – Telescope with Cast-iron Lid and Cuff
(lid with ventilation)

EAN CODE	EAN	DN	CAPACITY (t)	h (mm)	PACKING	PALLETE
4052836602305	660230	300	40	610	1	4



RVTEL D 400 – Telescope with Cast-iron Lid and Cuff
(lid with grating)

EAN CODE	EAN	DN	CAPACITY (t)	h (mm)	PACKING	PALLETE
4052836664303	666430	300	40	495	1	4



RV - Lid Combi with concrete ring DN 400 OSMA

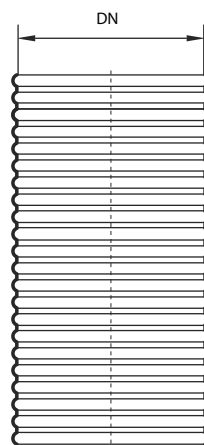
EAN CODE	EAN	DN1	DN2	DN3	h1	h2	PACKING	PALLETE
4052836605207	660520	410	700	640	110	70	1	4



RV DN 425

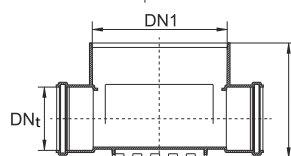
RVT – Shaft Tube DN 425 - Bellows

EAN CODE	EAN	l (mm)	PACKING	PALLETE
4025075350207	35020	2000	1	4
4025075350306	35030	3000	1	4
4025075350405	35060	6000	1	4



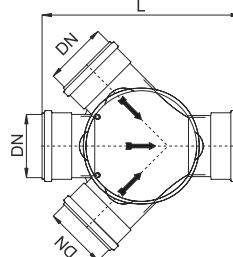
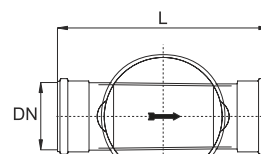
RVD-P – Shaft Bottom DN 425 (streight type)

EAN CODE	EAN	DNt	DN1	h (mm)	l (mm)	PACKING	PALLETE
4025075351303	35130	160	455	441	590	1	8
4025075352157	35215	200	455	510	513	1	8
4025075352355	35235	250	455	780	1130	1	4
4025075353253	35325	315	455	780	1080	1	4



RVD-PPL – Shaft Bottom DN 425 (streight type, left, right)

EAN CODE	EAN	DNt	DN1	h (mm)	l (mm)	PACKING	PALLETE
4025075351150	35115	160	455	432	536	1	8
4025075352102	35210	200	455	510	513	1	8
4025075352201	35220	250	455	780	1130	1	4
4025075353109	35310	315	455	780	1080	1	4



RVGM – reducing Cuff for RVTEL

EAN CODE	EAN	DN ₁	DN ₂	PACKING	PALLETE
4025075356117	35611	466	277	1	-



Těsnění pro teleskop RVTEL

EAN CODE	EAN	DN1	DN2	h	PACKING	PALLETE
4025075356209	35620	377	450	31	1	-



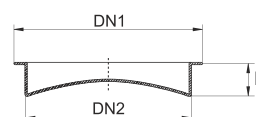
RVLP A15 OSMA – trafficable Lid

EAN CODE	EAN	MATERIAL	CAPACITY (t)	D (mm)	PACKING	PALLETE
4025075334009	35400	PLAST	1,5	360	1	6



Bottom of the Gully PP

EAN CODE	EAN	DN1	DN2	h	PACKING	PALLETE
	66160	460	393	100	1	-



RV - cast iron grate (rain) DN 400, 425

EAN CODE	EAN	MATERIAL	CAPACITY (t)	D (mm)	PACKING	PALLETE
4025075354366	35436	Cast-iron	40t	360	1	6



RVLP A15 –Telescope with trafficable Cast-iron Lid
(lid without ventilation)

EAN CODE	EAN	DN	CAPACITY (t)	h (mm)	PACKING	PALLETE
4025075334009	666450	300	12,5	610	1	6

RVTEL B 125 –Telescope with Cast-iron Lid
(lid without ventilation)

EAN CODE	EAN	DN	CAPACITY (t)	h (mm)	PACKING	PALLETE
4052836664006	666400	300	12,5	495	1	6

RVTEL B 125 –Telescope with Cast-iron Lid
(lid with grating)

EAN CODE	EAN	DN	CAPACITY (t)	h (mm)	PACKING	PALLETE
4052836664105	666410	300	12,5	495	1	6

RVTEL D 400 –Telescope with Cast-iron Lid
(lid without ventilation)

EAN CODE	EAN	DN	CAPACITY (t)	h (mm)	PACKING	PALLETE
4052836664204	666420	300	40	495	1	4

RVTEL B 125 –Telescope with Cast-iron Lid
(lid without ventilation)

EAN CODE	EAN	DN	CAPACITY (t)	h (mm)	PACKING	PALLETE
4025075354113	35411	300	40	610	1	4

RVTEL D 400 –Telescope with Cast-iron Lid
(lid without ventilation)

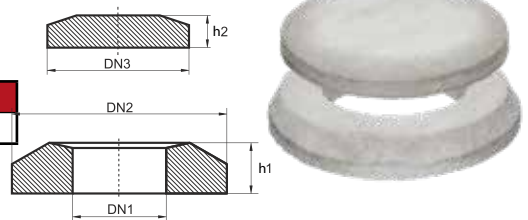
EAN CODE	EAN	DN	CAPACITY (t)	h (mm)	PACKING	PALLETE
4052836602305	35426	300	40	610	1	4

RVTEL D 400 –Telescope with Cast-iron Lid
(lid with grating)

EAN CODE	EAN	DN	CAPACITY (t)	h (mm)	PACKING	PALLETE
4052836664303	666430	300	40	495	1	4

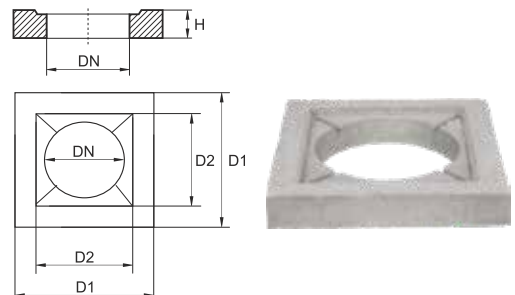
Concrete cone and cover for types 315 a 400

EAN CODE	EAN	DN1	DN2	DN3	h1	h2	PACKING	PALLETE
4025075355127	35512	470	700	640	110	70	1	4



Concrete frame for RVTEL typy 315, 400 a 425

EAN CODE	EAN	D1	D2	DN	H	PACKING
4025075345203	34520	440	350	330	100	1



RV - sediment trap

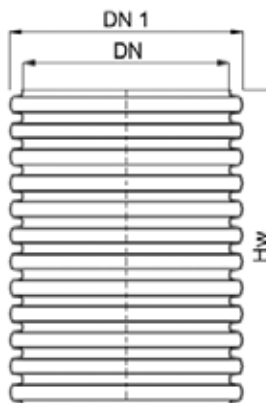
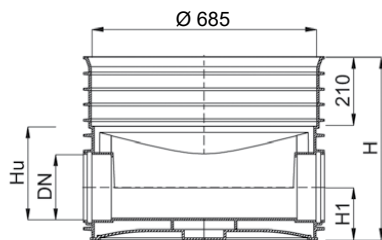
EAN CODE	EAN	DN	PACKING	PALLETE
4025075335365	33536	300	1	-
4025075335363	35536	425		



RV DN 600

RVT – Shaft Tube DN 600 - Bellows

EAN CODE	EAN	I (mm)	DN1(mm)	Hw1(mm)	PALLETE
405283611101	661110	1000	685	138	2
405283611200	661120	2000	685	158	2
405283611309	661130	3000	685	232	2
405283611606	661160	6000	685	232	2



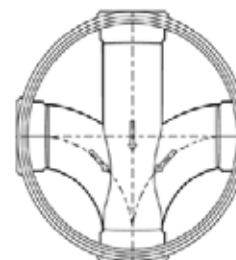
RVD-P – Shaft Bottom DN 600 with Seal (streight type)

EAN CODE	EAN	DN	H(mm)	Hu(mm)	H1(mm)	PALLETE
405283610005	661000	160	555	260	138	8
405283610203	661020	200	555	278	158	8
405283610401	661040	250	702	391	232	6
405283610609	661060	315	702	448	232	6
405283610807	661080	400	702	476	246	6



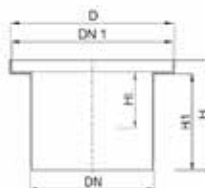
RVD-PPL – Shaft Bottom DN 600 with Seal (streight type, left, right)

EAN CODE	EAN	DN	H(mm)	Hu(mm)	H1(mm)	PALLETE
405283610104	661010	160	555	260	138	8
405283610302	661030	200	555	278	158	8
405283610500	661050	250	702	391	232	6
405283610708	661070	315	702	448	232	4



Telescope adapter DN 600 Kl. B 125 (with Seal)

EAN CODE	EAN	DN	DN1(mm)	Hw(mm)	H1(mm)	Ht(mm)	PALLETE
405283612009	661200	600	770	800	490	290	6



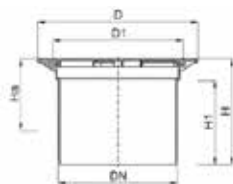
Telescope adapter DN 600 Kl. D 400 (with Seal)

EAN CODE	EAN	DN	DN1(mm)	Hw(mm)	H1(mm)	Ht(mm)	PALLETE
405283612207	661220	600	770	800	490	290	6



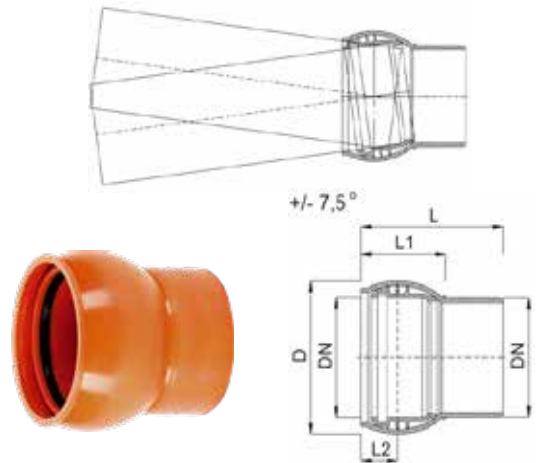
Telescope with Lid A 15 PP DN 600 (with Seal)

EAN CODE	EAN	DN	DN1(mm)	Hw(mm)	H1(mm)	Ht(mm)	PALLETE
405283612504	661250	600	770	800	490	290	6



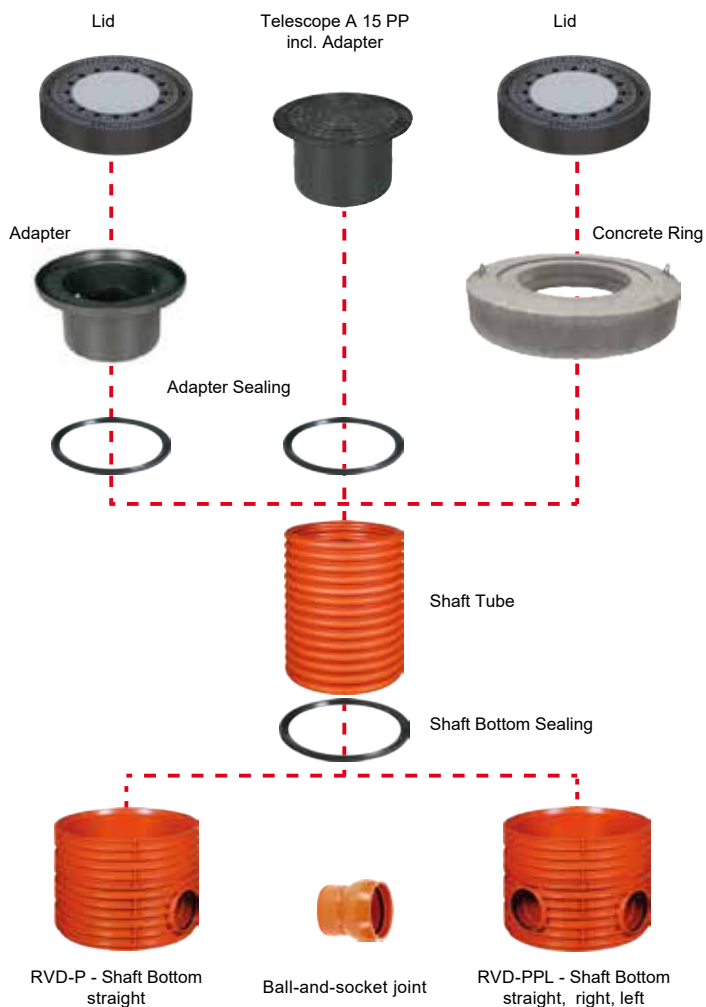
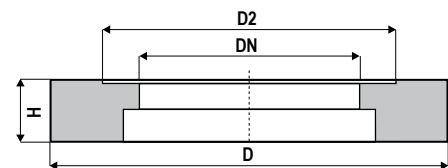
Ball-and-socket joint 0-7,5 °

EAN CODE	EAN	DN	L(mm)	L1(mm)	L2(mm)	PALLETE
405283614003	661400	swinging neck DN 160	205	122	53	1
405283614102	661410	swinging neck DN 200	245	146	63	1
405283614201	661420	swinging neck DN 250	305	186	80	1
405283614300	661430	swinging neck DN 400	362	217	92	1



Concrete Ring DN 600

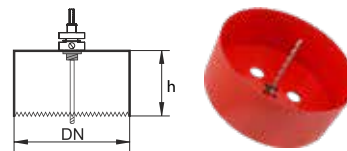
EAN CODE	EAN	DN1	Hw	DH1	Ht	PACKING
405283612603	661260	610	800	170	290	1



DN 600

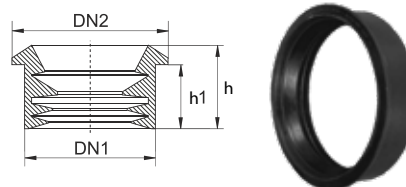
Caliper for Gasket in-situ

EAN CODE	EAN	DN	DN1	h	PACKING	PALLETE
4025075399008	39900	110	138	89	1	-
4025075399206	39920	160	186	89	1	-
4025075399305	39930	200	228	89	1	-



Gasket In-situ

EAN CODE	EAN	DN	DN1	DN2	h	h1	PACKING	PALLETE
4025075346156	34615	110	134	151	55	48	1	-
4025075346200	34620	160	190	205	64	48	1	-
4025075346255	34625	200	230	250	59	49	1	-



RVLS – Sewage basket

EAN CODE	EAN	DN	d (mm)	PACKING	PALLETE
4052836602701	660270	315	300	1	-



RVGM – spare Sealing Collar for RVTEL

EAN CODE	EAN	DN ₁	DN ₂	PACKING	PALLETE
4052836603005	660300	400	315	1	-



SHAFT DN 400/110	Embedded depth [mm]	Shaft Tube RVT	Shaft Bottom RVD-P RVD-PPL		TELESCOP (RVTEL) according to offer
	700-1250	DN 400/500 mm	DN 400/110		
	CODE	660100	660000	660010	
	1250-1750	DN 400/1000 mm	DN 400/110		
	CODE	660120	660000	660010	
	1750-2200	DN 400/1500 mm	DN 400/110		
	CODE	660140	660000	660010	
	2200-2750	DN 400/2000 mm	DN 400/110		
	CODE	660150	660000	660010	

Remark: Most Common Elements Shaft 's assembly.

SHAFT DN 400/110	Embedded depth [mm]	Shaft Tube RVT	Shaft Bottom RVD-P RVD-PPL		TELESCOP (RVTEL) according to offer
	700-1250	DN 400/500 mm	DN 400/160		
	CODE	660100	660020	660030	
	1250-1750	DN 400/1000 mm	DN 400/160		
	CODE	660120	660020	660030	
	1750-2200	DN 400/1500 mm	DN 400/160		
	CODE	660140	660020	660030	
	2200-2750	DN 400/2000 mm	DN 400/160		
	CODE	660150	660020	660030	

Remark: Most Common Elements Shaft 's assembly.

SHAFT DN 400/110	Embedded depth [mm]	Shaft Tube RVT	Shaft Bottom RVD-P RVD-PPL		TELESCOP (RVTEL) according to offer
	700-1250	DN 400/500 mm	DN 400/200		
	CODE	660100	660040	660050	
	1250-1750	DN 400/1000 mm	DN 400/200		
	CODE	660120	660040	660050	
	1750-2200	DN 400/1500 mm	DN 400/200		
	CODE	660140	660040	660050	
	2200-2750	DN 400/2000 mm	DN 400/200		
	CODE	660150	660040	660050	

Remark: Most Common Elements Shaft 's assembly.

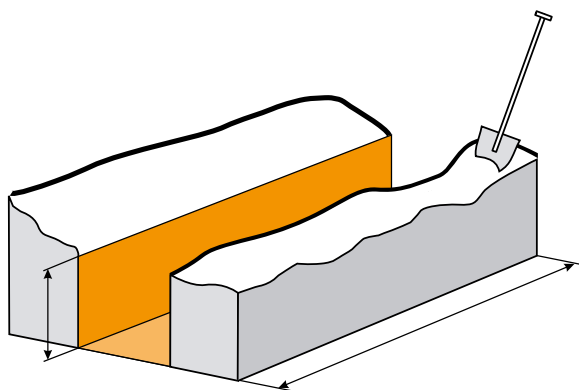


1. SCOPE OF VALIDITY

The following instructions cover the recommended rules for the shaft system assembly only. We thus recommend that the applicable national standards and safety regulations are adhered to.

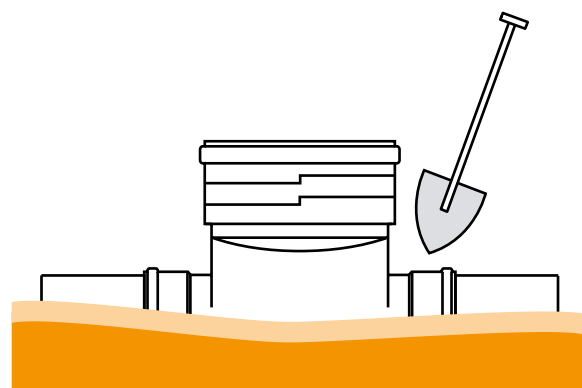
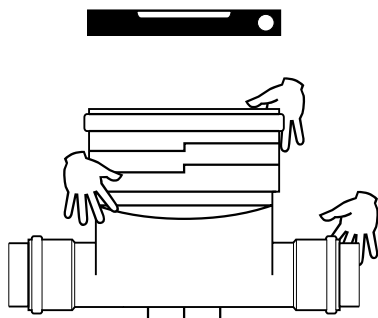
2. CONSTRUCTION - EXCAVATION

There is no need to widen the excavation too much for building in the shafts of RV-System OSMA® since the width is sufficient where two or three excavation branches come into contact. When installing a direct-type shaft in a narrow excavation the width must be increased slightly to triple the dimensions of the shaft concerned.



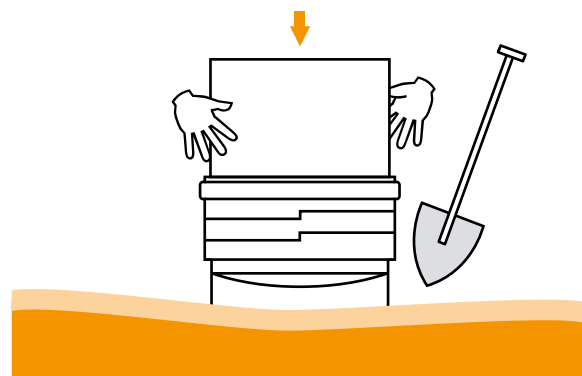
3. INSTALLING THE SHAFT BOTTOM

Given the shaft bottom weight that is not in excess of 10 kg, one worker is sufficient to perform the installation. The procedure is as follows: Firstly, the useless inlets must be blinded using the KGM or PPKGM socket gates. Then the shaft bottom is placed in the excavation bottom into a bed prepared of the same material as the bed for the sewerage pipeline. The bottom's upper edge must be aligned with the horizontal level in advance (the bottom profile provides a gradient of about 1.5%). Insert the sewerage pipeline tubes into the inlets and use the pack to pour it over the complete bottom, compacting it simultaneously - the best way is to treading the pack down with one's feet. With the bottom packed under the crown of the incoming pipes the shaft bottom's upper edge is checked once again for the water level to correct any possible inaccuracies. The bottom shall be packed up to the upper edge.



4. FITTING THE SHAFT TUBE

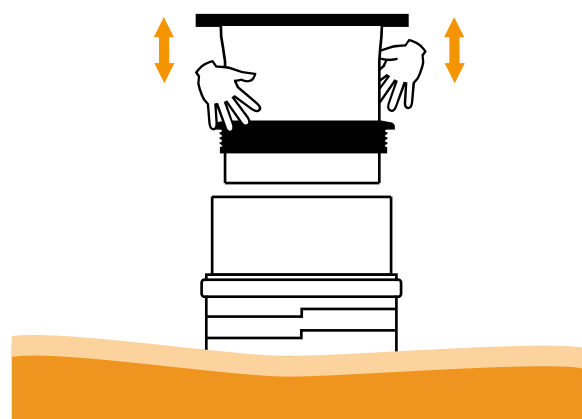
After the assembly lubricant has been applied to the shaft bottom sealing, insert a shaft tube of the suitable length all the way into the shaft bottom socket. Pack the shaft tube gradually and compact each 30 cm layer of the pack.



5. SETTING THE TELESCOPE'S RUBBER SEALING CUFF

When the pack level reaches the height required for assembly of the telescope, the rubber sealing cuff on the telescope body must be set to a position corresponding to the designed level of the ground, roadway or other consolidated surface.

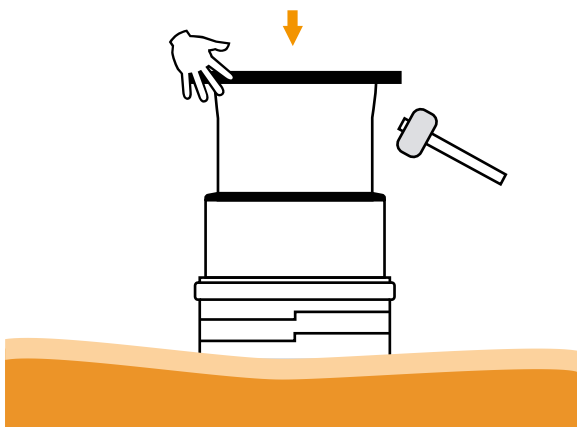
6. SLIPPING ON AND FIXING THE TELESCOPE



Slip the telescope on the shaft tube and set the lid height to the terrain level. Tap the rubber sealing cuff with your fist or a mallet to fix the telescope in the shaft tube. The shaft is assembled tightly now so you can finish the packing and compacting jobs.

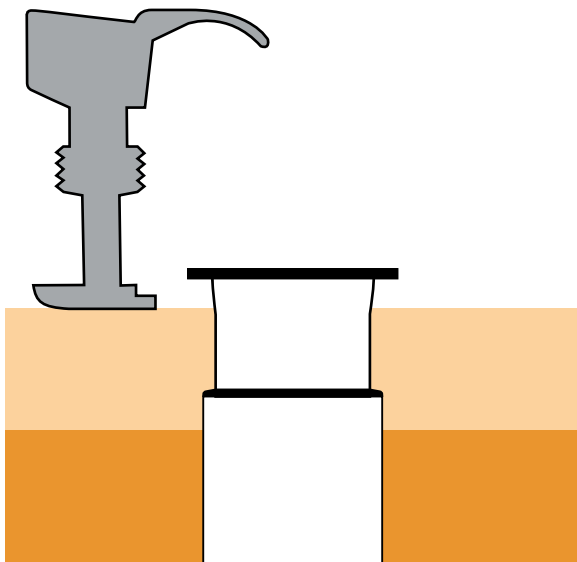
7. COMPACTING THE LAST LAYER

The last layer, about 30 cm in height must be properly “rammed down”. Use a mechanical rammer when building the shafts on the heavy traffic roadways.

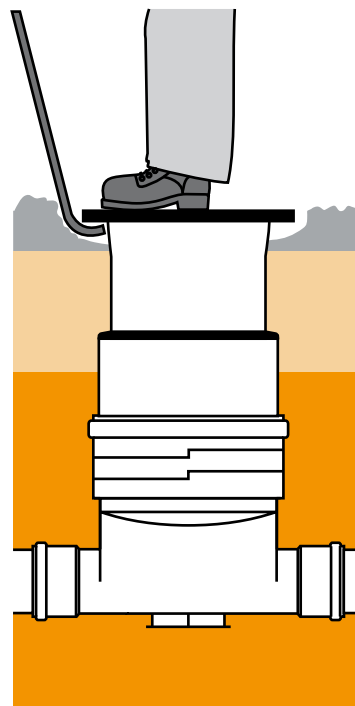
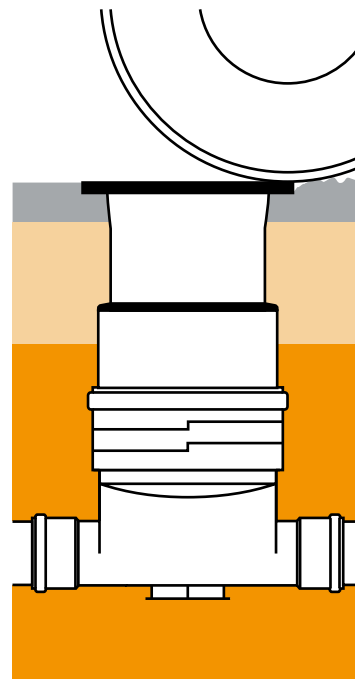


8. SHAFTS IN A ROAD BITUMINOUS SURFACE

When constructing a road, the shaft's closed lid, freed from bituminous mixture remainders, shall be rolled along with the road surface. In reconstructing the bituminous



roadway (laying new blacktop) the telescope must be uncovered up to the cuff, a new lid height is set and the cuff is fixed again.



INSTALLATION MANUAL

Manholes must be installed according to the technical specifications, in properly prepared and drained trench.

1. Excavation is necessary to remove large and sharp stones and bottom covered min. 10 cm of coarse sand

2. Place in the bottom of the shaft excavation (we must not forget to compare levels, DNA profile provides a gradient of about 1.5%), connect the sewer pipe and backfill approximately 10 cm above the pipe to the bottom of the shaft from moving.

3. Manhole tube (bellows) is cut to the desired length. Cutting is the center of the rising waves, the seal is put into the first recess.

4. Clean the shaft, lubricate it with grease inside. Lubricant paint it also seals the sedimentation tube and then to fit the neck of the shaft bottom. Thus prepared the pit backfill. One layer of backfill shall not exceed 30 cm (gradual compaction).

5. Telescope Assembly

a) to RVT bellows (in the last recess on the inner side) is placed seals. Do bellows RVT then Insert telescope with cast iron lid RVTEL.

b) at the RVT DN 425, put the end of the bellows sealing cuff RVGM for a telescope with a cast iron lid, type TL.



RAINWATER DRAINS

With the help of the shaft tube (bellows) can be compiled gully. From bottom to place the shaft bottom mounted PP bottom gully. The upper part of the shaft should be covered with a suitable cover (eg. RVLP A15). Procedure for installation instructions.

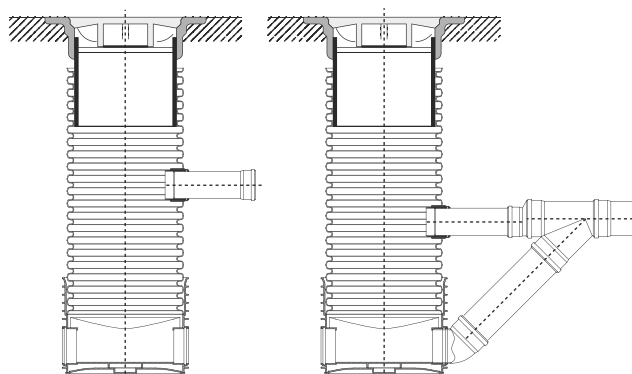
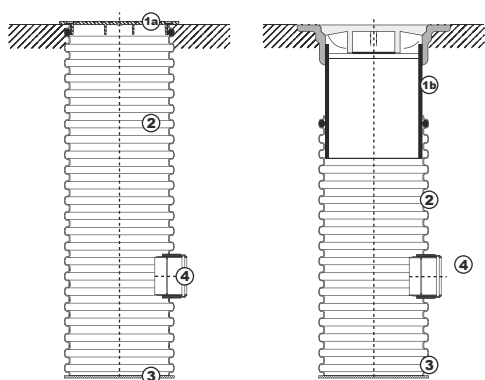
Seal in situ enables reliable connection channel and settling pits. Runoff from the mine can be done in any height, thanks to the seal assembly in situ.

WELL HOLES AND RAINWATER DRAINS

If you need to install sewer pipe above the bottom of the shaft, then we can use so called. Well holes. It connects via a seal in - situ to DN200. The connection is used branch and reduction, see pictures.

Picture description

- 1a. hatch
- 1b. Telescope with cast iron cover
- 2 Manhole oven (bellows)
3. The bottom gully PP
4. Gasket in-situ



IN SITU SEAL ASSEMBLY

1. Drill pipe hole at the desired height and clean from debris
2. Put seal to the hole and greased inside
3. Connect sewer pipe



Polypropylene chemical stability

COMPOUND	Concentration [%]	Temperature [°C]		
		20	40	60
acetone	100	+	SDgr	
gaseous ammonia	100	+	+	
ammonium, hydrous sol.	concd. soln.	+	+	
ammonium, hydrous sol.	10	+	+	
amyl alcohol, pure		+	+	
acetaldehyde	100	+		
benzenamine	100	+		+
benzaldehyde	100	+		
benzaldehyde, sol. aq.	sat.	+		
benzine	(see "Technical liquids")			
benzole	100	-*	-	
liquid bromide	100	-		
bromide fumes	high	-	-	
bromide fumes	dil.	SDgr	-	
bromide water	sat.	-	-	
liquid butane	100	+		
butane gas	100	+	+	
butyl acetate	100	+	SDgr	
cyclohexane	100	+		
cyclohexanol	100	+	+	
cyclohexanone	100	+	-	
dibutylphthalate	(see "Technical liquids")			
diethyl ether	100	SDgr		
potassium dichromate, sol. aq.	sat.	+	+	+
dimethylformamide	100	+		
1,4-dioxan	100	+	SDgr	-
ammonium nitrate, hydrous	all	+	+	+
potassium nitrate, sol. aq.	sat.	+	+	
sodium nitrate, sol. aq.	sat.	+	+	
calcium nitrate, sol. aq.	sat.	+	+	+
ethyl acetate	100	SDgr	SDgr	
ethyl alcohol	100	+		
ethyl alcohol, sol. aq.	96	+	+	
ethyl alcohol, sol. aq.	50	+	+	
ethyl alcohol, sol. aq.	10	+	+	
ethyl-benzene	100	SDgr	-	
ethylene chloride	100	SDgr	-*	
2-ethoxyethanol	100	+		
ethyl chloride	100	-		
ethyl ether see "diethyl ether"				
phenol	sat.	+	+	
formaldehyde, sol. aq.	40	+	+	
formaldehyde, sol. aq.	30	+	+	
formaldehyde, sol. aq.	10	+	+	
triethylamine phosphate, hydrous	all	+	+	+
sodium phosphate, sol. aq.	sat.	+	+	+
glycerine	100	+	+	
glycerine, sol. aq.	high	+	-	-
glycerine, sol. aq.	dil.	+	-	-
glycol	100	+	+	
glycol, sol. aq.	high	+	+	
glycol, sol. aq.	dil.	+	+	+
heptane	100	+	SDgr	
hexane	100	+	SDgr	
aluminium salts	all	+	+	+
hydrogen sulphite sodium, sol. aq.	sat.	+	+	
sodium bicarbonate, sol. aq.	sat.	+	+	+
potassium hydroxide	50	+	+	
potassium hydroxide	25	+	+	
potassium hydroxide	10	+	+	

COMPOUND	Concentration [%]	Temperature [°C]		
		20	40	60
sodium hydroxide	100	+	+	
liquid chlorine	100	-		
chlorine gas, anhydrous	100	-	-	-
chlorine gas, humid	10	SDgr	-	-
chlorobenzene	100			
sodium chlorate, sol. aq.	5	+		
ammonium chloride, sol. aq.	all	+	+	+
tin dichloride	sat.	+	+	
potassium chloride, aq.	sat.	+	+	+
sodium chloride, sol. aq.	sat.	+	+	+
calcium chloride, hydrous	sat.	+	+	+
sodium perchlorate, sol. aq.	5	+	+	
potassium hypochlorite, sol. aq.	sat.	+	+	
sodium hypochlorite, sol. aq.	25	+	+	
chloroform	100	-*	-	
chlorine water	sat.	SDgr	-	
muratic acid gas	high	+	+	
iso-octane	100	+	SDgr	
isopropyl alcohol	100	+	+	
potassium iodide, hydrous	sat.	+	+	
hydroxytoluene	100	+	SDgr	
hydroxytoluene, sol. aq.	sat.	+	SDgr	
benzenecarboxylic acid	100	+	+	
benzenecarboxylic acid, sol. aq.	sat.	+	+	+
boracic acid	100	+	+	
boracic acid, hydrous	sat.	+	+	
citric acid, sol. aq.	sat.	+	+	+
nitric acid	50	SDgr	-	
nitric acid	25	+	+	
nitric acid	10	+	+	
fluorohydric acid	40	+	+	
orthophosphoric acid	sat.	+	SDgr	
orthophosphoric acid	50	+	+	
orthophosphoric acid	10	+	+	+
hydrochloric acid	sat.	+	+	
chlorosulphonic acid	100	-	-	
chromic acid	sat.	+	-	
chromic acid	20	+	SDgr	
butanedioic acid, sol. aq.	sat.	+	+	
lactacid, sol. aq.	90	+	+	
lactacid, sol. aq.	50	+	+	
lactacid, sol. aq.	10	+	+	+
methanoic acid	98	+	SDgr	
methanoic acid	90	+		
methanoic acid	50	+	+	
methanoic acid	10	+	+	+
glacial acetic acid	100	+	SDgr	-
acetic acid, sol. aq.	50	+	+	
acetic acid, sol. aq.	10	+	+	+
oleic acid	100	+		
sulphuric acid	96	+	SDgr	
sulphuric acid	50	+	+	
sulphuric acid	25	+	+	
sulphuric acid	10	+	+	+
stearic acid	100	+		
ethanedioic acid, sol. aq.	sat.	+	+	+
2,3-dihydroxybutanedioic acid, sol. aq.	sat.	+	+	
permanganate of potassium, sol. aq.	sat.	+	+	
methanol	100	+	+	
methanol, sol. aq.	50	+	+	

COMPOUND	Concentration [%]	Temperature [°C]		
		20	40	60
methane ethyl ketone	100	+	SDgr	
methyl chloride	100	SDgr		
mineral oils	(see "Technical liquids")			
urea, sol. aq.	sat.	+	+	
naphthalene	100	+		
naphthalene	100	-*	-	-
soda lime	50	+	+	
soda lime	25	+	+	
soda lime	10	+	+	+
n-butanol	100	+	+	
nitrobenzene	100	+	SDgr	
ammonium acetate, sol. aq.	all	+	+	+
octane see "iso-octane"				
diphosphorus pentoxide	100	+		
sulphur dioxide	dil.	+	+	
ozone < 0,5 ppm		+	-*	
hydrogen dioxide, sol. aq.	90			
hydrogen dioxide, sol. aq.	30	+	SDgr	
hydrogen dioxide, sol. aq.	10	+	+	
hydrogen dioxide, sol. aq.	3	+	+	+
potassium persulphate, sol. aq.	sat.	+		
propane, liquid	100	+		
propane gas	100	+	+	
pyridine	100	+	SDgr	
mercury	100	+	+	
sulphur	100	+	+	+
ammonium sulphate, sol. aq.	all	+	+	+
potassium sulphate, sol. aq.	sat.	+	+	+
sulphate of strontium, sol. aq.	sat.	+	+	+
carbon sulphide	100	SDgr		
hydrogen sulphide	dil.	+	+	
sodium sulphite, sol. aq.	sat.	+	+	
barium salts	all	+	+	+
magnesium salts, sol. aq.	sat.	+	+	+
chromium salts 2+, 3+	sat.	+	+	
copper salts	sat.	+	+	+
nickel salts	sat.	+	+	
mercury salts, sol. aq.	sat.	+	+	
argent salts	sat.	+	+	
zinc salts, sol. aq.	sat.	+	+	
ferrous salts, sol. aq.	sat.	+	+	+
sodium sulphide, sol. aq.	sat.	+	+	
trisodium tetraborate, sol. aq.	sat.	+	+	+
tetrahydrofuran	100	SDgr	-	
tetrahydro-naphthalene	100	SDgr	-	
tetrachloroethane	100	SDgr	-	
tetrachloromethane	100	SDgr	-	
thiophene	100	SDgr	-	
sodium thiosulphate, sol. aq.	sat.	+	+	
toluene	100	SDgr	-	
chloral	100	SDgr	-*	
ammonium carbonate, sol. aq.	all	+	+	+
potassium carbonate (potash)	sat.	+	+	
carbonate of soda (soda)	sat.	+	+	
carbonate of soda (soda)	10	+	+	+
water	100	+	+	+
xylene	100	SDgr	-	
Technical liquids				
accumulator acid		+	+	
asphalt		+	SDgr	
petrol, pure		+	SDgr	
unleaded petrol		+	SDgr	

COMPOUND	Concentration [%]	Temperature [°C]		
		20	40	60
leaded petrol		+	SDgr	
super petrol		+*	SDgr	
bleaching liquor (12,5 % Cl)		SDgr	SDgr	
sodium tetraborate, sol. aq.	sat.	+	+	
pine oil		+	+*	
brake fluid		+	+	
tar		+	SDgr	
Formalin*		+	+	
photographic developer	usual	+	+	
Fridex*		+	+	
calcium hypochlorite		+	+	
chromium tanning bath		+	+	
chromium-sulphur mixture		-	-	
alumen, sat.		+	+	
shoe polish		+	SDgr	
Kresolum saponatum*		+		
anti-moth marbles		+		
Lanolin*		+	SDgr	
LITEX*		+	+	
flax-seed oil		+	+	
Lysof*		+	SDgr	
mineral oils (w/o aromates)		+	SDgr	-
engine oils		+	SDgr	-
diesel fuel		+	SDgr	
synthetic degreasers	c. u.	+	+	+
two-cycle engine oil		SDgr	SDgr	
typewriter oil		+	+*	
transformer oil		+	SDgr	
fuming sulphuric acid	all	-	-	
paraffin	100	+	+	-
paraffin oil	100	+	SDgr	-
pectose, sat.		+	+	
pectrol-ether	100	+	SDgr	
furniture polish		+	SDgr	-
laundry agents high		+	+	
Sagrotan*		+	SDgr	
kitchenware detergent		+	+	+
silicone oil		+	+*	
spruce oil		+	+*	
soda	(see "carbonate of soda")			
Solvina		+	+	
turpentine		SDgr	-	
fuel oil		+	SDgr	
graphite		+	+	
fixative bath	10	+	+	
salt water		+	+	+
aqueous glass		+	+	
floor polish		+	SDgr	
softening agent – dibutylphthalate		+	SDgr	
softening agent – dibutyl sebacate		+		
softening agent – dihexylphthalate		+		
softening agent – dinonyl-adipate		+		
softening agent – dioctyl-adipate		+		
softening agent – dioctyl-phthalate		+		
softening agent – tricresyl phosphate		+		
softening agent – trioctyl phosphate		+		
Pharmaceuticals and cosmetics				
Aspirin*		+		
Quinine		+		

COMPOUND	Concentration [%]	Temperature [°C]		
		20	40	60
iodine tincture		+		
bornyl chloride		+		
finger nail polish		+		
menthol		+		
soap and soapflakes		+		
soap solution	sat.	+	+	+
soap solution	10	+	+	+
finger nail polish remover		+	SDgr	
perfumes		+		
hair shampoo		+	+	
paraffin jelly		+	SDgr	
toothpaste		+	+	
Food and eatables				
potato salad		+		
Coca-Cola*		+		
dry sugar		+	+	+
sugar solution		+	+	+*
tea tree leaves		+	+	
tea – drink		+	+	+*
lemon pulp and peel		+		
apple pulp		+	+	+*
orange pulp and peel		+		
essential oils		+	SDgr	
gin	40	+		
mustard		+		
cocoa – drink		+	+	+
cocoa – powder		+		
coffee (beans and ground coffee)		+		
coffee – drink		+	+	+
ketchup		+	+	
cognac		+		
spices		+		
fish in vinegar		+	+	+*
pickled cabbage		+	+	+*
liqueur	all	+		
lemonade		+		
beef tallow		+	+	
mayonnaise		+		
margarine		+	+	
jam		+	+	+*
butter		+	+	
honey		+	+	
milk products		+	+	+*
milk		+	+	+*
flour		+		
vinegar	c. u.	+	+	
lemon oil		+		
coconut oil		+	+*	
peppermint oil		+		
olive oil		+	+	
palm oil		+	SDgr	
orange oil		+		
vegetable oil		+	SDgr	
soya bean oil		+	SDgr	
corn-germ oil		+	SDgr	
peanut oil		+	+*	-*
animal oil		+	SDgr	
fruit salad		+		
baked goods		+	+	+*
beer		+		
butter milk		+		
pudding		+	+	+*

COMPOUND	Concentration [%]	Temperature [°C]		
		20	40	60
rum	40	+	+	
fish oil		+		
lard		+	SDgr	
salami		+	+	
beet syrup	all	+	+	+*
herrings		+		
carbonated water		+		
salt brine		+	+	+
common salt	(see "sodium chloride")			
cheese		+		
fecula – sol. aq.	all	+	+	
whipped cream		+		
pineapple juice		+	+	
lemon juice		+	+	
grapefruit juice		+	+	
apple juice		+	+	
fruit juice		+	+	
orange juice		+	+	
tomato sauce		+	+	
roast-food sauce		+	+	+*
lemon essence		+		
bitter almond essence		+		
vinegar essence	c. u.	+	+	
rum essence		+		
vanilla essence		+	+	
cottage cheese		+		
eggs (raw and cooked)		+	+	+*
wine		+	+	
whisky	40	+		
vegetables		+	+	+*
gelatine		+	+	+*

Legend :

+	resistance
+*	partial resistance
SDgr	conditional resistance
-*	low resistance
-	instability
no classification	not tested
all	all concentrations
concd. soln.	concentrated solution
low conc.	low concentration
c. u.	commonly used concentration
usual	usual, commercial concentration
dil.	diluted solution
sol. aq.	aqueous solution
sat.	cold-saturated solution
hot sat.	hot-saturated solution
m. a.	minute amounts

Chemical stability of unplasticized polyvinyl chloride

COMPOUND	Concentration [%]	Temp. [°C]		
		20	40	60
acetaldehyde	100			
acetaldehyde	40	°	°	
acetaldehyde+acetic acid	90/40	°		
acetanhydride	100	-		
acetone	m. a.	-		
acetone	100	-		
allyl alcohol	96	°		
liquid ammonia	100	°	°	
gaseous ammonia	100	+	+	+
pure phenylamine	100	-		
phenylamine hydrochloride, hydrous	sat.	°		
anon	100	-		
inorganic fertilizers	up to 10	+	+	°
inorganic fertilizers	sat.	+	+	+
antiformin hydrous	2	+		
Asfluid I, liquid		-		
benzaldehyde, sol. aq.	0.1	-	-	-
benzine	100	+	+	+
benzine-benzole mixture	80/20	-	-	-
sodium benzoate, sol. aq.	up to 10	+	+	
sodium benzoate, sol. aq.	up to 36			°
benzole	100	-	-	-
bleach liquid (12.5 % active chlorine)	c. u.	+	+	°
sodium tetraborate, sol. aq.	dil.	+	+	°
sodium tetraborate, sol. aq.	sat.			°
potassium borate, sol. aq.	1	+	+	°
liquid bromide	100	-		
gaseous bromide	low conc.	°		
potassium bromate, sol. aq.	dil.	+	+	°
potassium bromate, sol. aq.	dil.	+	+	°
potassium bromate, sol. aq.	sat.	+	+	+
bromide water	sat.	°	°	
butadiene	100	+	+	+
butane gas	50	+		
succinaldehyde	up to 10	+	°	-
butanol	up to 100	+	+	°
butine-diol	100		°	
butyl acetate	100	-		
butylphenol	100	°		
cellulose, sol. aq.	sat.	+	°	
cycannone	c. u.	+	+	+
cyclohexanol	100	-	-	-
cyklohexanone	100	-	-	-
tanning cellulose extracts	usual			
tanning herbal extracts	usual	+		
ammonia liquor	sat.	+	+	°
densodrine	c. u.	+	+	+
dextrine, sol. aq.	sat.	+		
dextrine, sol. aq.	18			°
potassium dichromate, sol. aq.	40	+		
ammonium nitrate, hydrous	dil.	+	+	°
ammonium nitrate, hydrous	sat.	+	+	+
potassium nitrate, sol. aq.	sat.	+	+	+
potassium nitrate, sol. aq.	dil.	+	+	°
silver nitrate, sol. aq.	up to 8	+	+	°
calcium nitrate, sol. aq.	50	+	+	+
paraffine emulsions	c. u.	+	+	
acetic ester	100	-		
ethyl-acrylate	100	-		
ethyl alcohol (inoculum)	c. u.	+	+	°
ethyl alcohol and acetic acid (fermentation mixture)	c. u.	+	°	
denaturated ethyl alcohol (2 % of toluene)	96	+	°	°
ethyl alcohol, sol. aq.	96	+	+	°
ethylene chloride	100	-		
ethylene oxide, liquid	100	-		
ethyl ether	100	-		
phenol water	up to 90	°	°	-
phenol water	1	+		

COMPOUND	Concentration [%]	Temp. [°C]		
		20	40	60
phenylhydrazine	100	-		
phenylhydrazine-hydrochloride, sol. aq.	sat.	°		
ferri-cyanide and ferro-cyanide				
potassium sol. aq.	dil.	+	+	°
potassium sol. aq.	sat.	+	+	+
ammonium fluoride, hydrous	up to 20	+		°
copper difluoride, hydrous	2	+	+	+
nitrogen fluoride, sol. aq.	up to 20	+		°
formaldehyde, sol. aq.	dil.	+	+	°
formaldehyde, sol. aq.	40	+	+	+
phosphane	100	+		
gaseous carbonyl dichloride	100	+		°
liquid carbonyl dichloride	100	-		
photoemulsion	all	+	+	
fixative	c. u.	+	+	
developing agent	c. u.	+	+	
FRIGEN *	100	+		
fructose (grape sugar), sol. aq.	sat.	+	+	°
glycerine, sol. aq.	all	+	+	+
glycocol, sol. aq.	10	+	+	+
glycol, sol. aq.	c. u.	+	+	+
hexane-triol	c. u.	+	+	+
beef tallow, sulphonate emulsion	c. u.	+		
hydrogen sulphite sodium, sol. aq.	dil.	+	+	°
hydrogen sulphite sodium, sol. aq.	sat.	+	+	+
hydroxylamine sulphate, sol. aq.	up to 12	+	+	
chlophene	c. u.	°		-
chlorine gas, anhydrous	100	°	°	-
chlorine gas, hydrous	0.5	+		
chlorine gas, hydrous	1	°		
chlorine gas, hydrous	5	°		
chlorine gas, hydrous	97	°		
liquified chlorine		-		
chloramine, sol. aq.	dil.	+	-	-
sodium chlorate, sol. aq.	up to 10	+	+	°
sodium chlorate, sol. aq.	sat.	+	+	+
ammonium chloride, hydrous	dil.	+		°
ammonium chloride, hydrous	sat.	+	+	+
antimonous chloride, hydrous	90	+	+	+
tin bichloride, hydrous	sat.	+	+	°
tin bichloride, hydrous	dil.	+	+	°
potassium chloride, sol. aq.	sat.	+	+	+
potassium chloride, sol. aq.	dil.	+	+	°
trichloride phosphorus	100	-		
aluminium trichloride, hydrous	dil.	+	+	°
aluminium trichloride, hydrous	sat.	+	+	+
magnesium chloride, hydrous	dil.	+	+	°
magnesium chloride, hydrous	sat.	+	+	+
copper chloride, hydrous	sat.	+	+	
sodium chloride	(see Common salt)			
calcium chloride, hydrous	dil.	+	+	°
calcium chloride, hydrous	sat.	+	+	+
chloride zinc, hydrous	sat.	+	+	+
chloride zinc, hydrous	dil.	+	+	°
ferric chloride	up to 10	+	+	°
ferric chloride	sat.	+	+	+
potassium perchlorate, sol. aq.	1	+	+	°
sodium hypochlorite, sol. aq.	dil.	+		
chlorine water	sat.	°	°	
chlorine hydride, hydrous		+	+	
hydrogen chloride, anhydrous		+	+	+
potassium chromate, sol. aq.	40	+	+	+
chrome alum, sol. aq.	dil.	+	+	°
chrome alum, sol. aq.	sat.	+	+	+
chromium-sulphur cleaning mixture	50/15/35	+	+	°
metallic iodine and in alkaline solution		-		
hydrous alumen	dil.	+	+	°

COMPOUND	Concentration [%]	Temp. [°C]		
		20	40	60
hydrous alumen	sat.	+	+	+
carbolineum, fruit origin	c. u.	+		
acacia	c. u.	+		
hydroxytoluene, sol. aq.	up to 90	°	°	
crotonaldehyde	100	-		
colour agents	c. u.	+	+	+
potassium cyanide, sol. aq.	up to 10	+	+	°
adipinic acid	sat.	+	+	°
antraquinone-sulphone acid				
aqueous suspension		+		
arsenic acid, sol. aq.	dil.	+	+	°
arsenic acid, sol. aq.	80	+	+	°
benzenecarboxylic acid	all	+	+	°
boracic acid, sol. aq.	sat.	+	+	°
bromhydric acid, sol. aq.	48	+	+	+
bromhydric acid, sol. aq.	up to 10	+	+	°
oxychlorine acid, sol. aq.	up to 10	+	+	°
oxychlorine acid, sol. aq.	sat.	+	+	+
hypochlorous acid, sol. aq.	10	+	+	°
hypochlorous acid, sol. aq.	20	+	+	°
hypochlorous acid, sol. aq.	1	+	+	°
chlorosulphonic acid	100	°		
chromic acid, sol. aq.	up to 50	+	+	°
citric acid, sol. aq.	sat.	+	+	+
citric acid, sol. aq.	up to 10	+	+	°
diethylene-glycol acid	30	+	+	°
diethylene-glycol acid	sat.	+		
nitric acid, sol. aq.	up to 50	+	+	°
nitric acid, sol. aq.	98	-		
fluorosilicic acid, sol. aq.	up to 32	+	+	+
orthophosphoric acid, sol. aq.	up to 30	+	+	°
orthophosphoric acid, sol. aq.	above 30	+	+	+
glycolic acid, sol. aq.	37	+		
2-hydroxybutanedioic acid, sol. aq.	1	+	+	
silicic acid, sol. aq.	all	+	+	+
(Z)-butenedioic acid, sol. aq.	sat.	+	+	°
(Z)-butenedioic acid, sol. aq.	35	+	+	
butanoic acid, concd. sol.		-		
butanoic acid, sol. aq.	20	+	-	-
methanesulfone acid	100	+	+	°
methanesulfone acid, sol. aq.	up to 50	+	°	
lactacid acid, sol. aq.	90	+	°	-
lactacid acid, sol. aq.	up to 10	+	+	°
monochloroacetic acid, sol. aq.	85	+		
monochloroacetic acid, sol. aq.	100	+	+	°
methanoic acid, hydrous	100	+	°	-
methanoic acid, hydrous	up to 50	+	+	°
methanoic acid, hydrous	50	+		°
acetic acid, sol. aq.	do 25	+	+	°
glacial acetic acid	100	°	-	
acetic acid, sol. aq.	25-60	+	+	+
acetic acid, sol. aq.	80	+	°	
cruce acetic acid	95		°	
(Z)-9-octadecenoic acid	c. u.	+	+	+
picric acid	1	+		
sulphurous acid (at 8 bar)	sat.	+		
sulphuric acid, sol. aq.	do 40	+	+	°
sulphuric acid, sol. aq.	40-80	+	+	+
sulphuric acid, sol. aq.	96	+	°	
sulphuric acid, sol. aq.	80-90			
chlorhydric acid, sol. aq.	do 30	+	+	°
chlorhydric acid, sol. aq.	concd.	+	+	+
stearic acid	100	+	+	+
ethanedioic acid, sol. aq.	sat.	+	+	+
ethanedioic acid, sol. aq.	dil.	+	+	+
carbonic acid, sol. aq. (up to 8 bar)	sat.	+		
2,3-dihydroxybutanedioic acid, sol. aq.	up to 10	+	+	°
2,3-dihydroxybutanedioic acid, sol. aq.	sat.	+	+	+
oxygen	all	+	+	+
spirits		+		
liqueurs		+		

COMPOUND	Concentration [%]	Temp. [°C]		
		20	40	60
caustic potash lye, sol. aq.	up to 40	+	+	°
caustic potash lye, sol. aq.	50-60	+	+	+
sodium lye, sol. aq.	up to 40	+	+	°
sodium lye, sol. aq.	50-60	+	+	+
aqua regia		°		
tallow	100	+	+	+
permanganate of potassium, sol. aq.	6	+	+	+
permanganate of potassium, sol. aq.	up to 18	+	+	
fatty acids	100	+	+	+
palm oil fatty acids	100	+	+	+
molasses	c. u.	+	+	°
molasses mixture	c. u.	+	+	+
Mersol D	c. u.	+	+	°
methanol, sol. aq.	32	°		
methanol	100	+	+	°
chloromethane	100	-		
methylene-chloride	100	+	+	°
mineral oils		+	+	+
beer wort	c. u.	+	+	
milk		+	+	+
urine		+	+	°
urea, sol. aq.	up to 10	+	+	°
urea, sol. aq.	33	+	+	+
Mowilith D	c. u.	+		
NEKAL BX [®] aq.	dil.	+	+	°
nicotine, sol. aq.	c. u.	+		
nicotinic preparates, sol. aq.	c. u.	+		
nitroglycerine	dil.	°		
nitroglycol	dil.	-		
oxides of nitrogen	concd. soln.	°		
wine vinegar	c. u.	+	+	+
acetate lead, sol. aq.	sat.	+	+	+
acetate lead, sol. aq.	dil.	+	+	°
acetate lead, sol. aq.	hot sat.	+	+	
mists containing sulphuric acid (hydrous)	all	+	+	+
mists containing sulphur trioxide	all	°		
mists containing carbon dioxide	all	+	+	+
mists containing hydrogen fluoride	all	+	+	+
mists containing sulphur dioxide	low concd.	+	+	+
mists containing carbon monoxide	all	+	+	+
mists containing nitrogene oxides	all	+	+	
mists containing fuming sulphuric acid	low conc.	+	+	+
mists containing chlorine hydride	all	+	+	+
mists containing oxides of nitrogen	all	+	+	+
flax-seed oil	100	+	+	
oils and fats		+	+	+
fuming sulphuric acid	10	-		
fruit juice	c. u.	+	+	+
fruit drinks	c. u.	+	+	+
diphosphorous pentaoxide	100	+		
sulphur dioxide, anhydrous	all	+	+	+
sulphur dioxide, hydrous	50	+	+	
sulphur dioxide, liquid	100	°		
sulphur dioxide, hydrous	all	+	+	°
carbon monoxide	100	+	+	+
carbon dioxide, anhydrous	100	+	+	+
carbon dioxide, hydrous	all	+	+	°
nitrogen oxides, hydrous and anhydrous	dil.			°
nitrogen oxides, hydrous	concd. soln.	-		
ozone	100	+	+	+
ozone	10	+		
paraffin alcohols	100	+	+	+
sulphuric acid fumes	higher	°		
sulphuric acid fumes	niz.	+		
hydrogen dioxide, sol. aq.	up to 30	+		
hydrogen dioxide, sol. aq.	up to 20	+	+	
potassium peroxydisulphate	sat.	+	+	°
potassium peroxydisulphate	dil.	+	+	°
beer		+	+	+

COMPOUND	Concentration [%]	Temp. [°C]		
		20	40	60
potash, sol. aq.	sat.	+	+	
propane gas		+		
propane, liquid	100	+		
propargyl alcohol, sol. aq.	7	+	+	+
plant protective agents	(see carbolineum and nicotinic preparates)			
pyridine	all	-		
mercury		+	+	+
carbon sulphide	100	°		
hydrogen sulphide, anhydrous	100	+	+	+
ethyl alcohol, sol. aq.	sat.	+	+	°
ammonium sulphate, hydrous	sat.	+	+	+
ammonium sulphate, hydrous	dil.	+	+	°
magnesium sulphate, sol. aq.	sat.	+	+	+
magnesium sulphate, sol. aq.	dil.	+	+	°
cupric sulphate, sol. aq.	sat.	+	+	+
cupric sulphate, sol. aq.	dil.	+	+	°
nickel sulphate, sol. aq.	dil.	+	+	°
nickel sulphate, sol. aq.	sat.	+	+	+
sodium sulphate, sol. aq.	dil.	+	+	°
sodium sulphate, sol. aq.	sat.	+	+	+
zinc sulphate, sol. aq.	sat.	+	+	+
zinc sulphate, sol. aq.	dil.	+	+	°
mixed acids (nitric/sulphuric/water)	50/50/0	°	-	
mixed acids (nitric/sulphuric/water)	10/20/70	+	+	
mixed acids (nitric/sulphuric/water)	10/87/3	°		
mixed acids (nitric/sulphuric/water)	50/31/19	+		
mixed acids (nitric/sulphuric/water)	48/49/3	+	°	
soda solution	sat.	+	+	+
soda solution	dil.	+	+	°
sodium bisulphide, sol. aq. with carbon dioxide	sat.	+	+	+
spinner acids with CS ₂	200 mg/l		°	
spinner acids with CS ₂	100 mg/l	+	+	
spinner acids with CS ₂	700 mg/l		-	
spinning viscose bath liquors		+	+	+
common salt, sol. aq.	dil.	+	+	°
common salt, sol. aq.	sat.	+	+	+
lighting gas w/o benzene		+		
fecula, sol. aq.	c. u.	+	+	+
tetrachlormethane	100	°	-	
tetraethyl lead	100	+		
thionyl chloride	concd.	-		
toluene	100	-		
trichlorethylene	100	-		
trietanolamine	100	-		
trimethylpropane, sol. aq.	c. u.		°	
trimethylpropane, sol. aq.	up to 10	+	+	°
potassium carbonate (sol. aq.)	(see potash)			
sodium carbonate	(see soda)			
wine spirits of all kinds		+		
wine spirit		+	+	
vinyl acetate	100	-		
white and red wine		+	+	+
salt water		+	+	°
water in general		+	+	°
carbonated water		+	°	°
distilled water		+	+	
soap water	concd.	+		°
drinking water		+	+	
spring water		+	+	
condensed water		+	+	
waste water (also acetic w/o organic solvents)		+	+	
waste water with minute amounts of phenols and butanol				
hydrogen	100	+	+	+
higher fatty alcohols	100	+	+	+
xylol	100	-		
gelatine, sol. aq.	all	+	+	

Legend :	
+	resistant
+	partially resistant
°	conditionally resistant
-	low resistance
-	instability
no classification	not tested
all	all concentrations
concd.	concentrated solution
low	low concentration
c. u.	commonly used concentration
usual	usual, commercial concentration
dil.	diluted solution
sol. aq.	aqueous solution
sat.	cold-saturated solution
hot sat.	hot-saturated solution
m. a.	minute amounts

