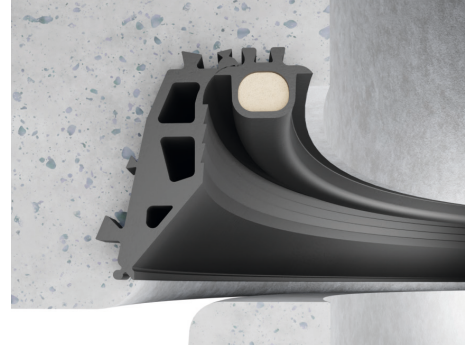


PRODUCT DATA SHEET

DS TOBNORM



The DS TOBNORM system consists of the combination of an integrated DS BS 2000 gasket and an integrated load balancing element for concrete and reinforced concrete and reinforced concrete with spigot end according to DIN 4034-1.

- DS BS 2000 is in accordance with the requirements of DIN EN 681-1 / DIN 4060 (seals made from elastomers) and the FBS quality guideline.
- DS BS 2000 manhole pipe connections fulfill, concerning durability, the criteria of DIN EN 1916, method 1.
- DS BS 2000 and the load balancing element can easily be connected to the manhole.
- DS BS 2000 is mounted on the socket end and the load balancing element is inserted into the bottom socket. Both elements will be anchored on concreting of the chamber components in the socket. After pulling the socket end the plug-in socket is ready for installation.
- DS BS 2000 requires special socket ends that determine the seat of the seal by their shape. In addition a recess must be provided in the bottom sleeve for the load balancing element.
- DS 2000 with the integrated load balancing element is suitable for the conventional manhole manufacturing equipment.
- DS BS 2000 with the integrated load balancing element is available in 3 profiles cross sections for manholes DN 800, DN 1000, DN 1200, DN 1500 & larger.

**Tested and quality controlled
by MPA Berlin-Brandenburg.**

SPECIAL ADVANTAGES

- The seal and load balancing element form a single unit with the manhole component and thus enable rapid, fast and safe installation in all weather conditions.
- The integrated sand hose relieves stress peaks between the manhole components and thus the permanent load-bearing capacity of the structure is significantly improved.
- High sealing reliability due to fully lined socket and integrated load compensation.
- DS TOPNORM system fits to the generally existing manhole spigot end with shoulder according to DIN 4034-1.
- Forms for the spigot end do not need to be procured.
- Double inventory for manhole bases is unnecessary.

MATERIAL

DS BS 2000 is made of styrene-butadiene rubber (SBR) with hardness 40 ± 5 IRHD and the load balancing element is made of styrene-butadiene rubber (SBR) with hardness 40 ± 5 IRHD. The materials withstand the usual stresses and strains by waste water.

Verified statics on the
overall structure and
Load bearing test on
Shaft rings

QR 4060



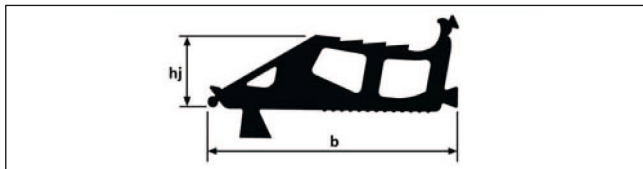
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Berlin-Brandenburg



DS
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DIMENSIONING OF THE SEALING RING

(all dimensions in mm)

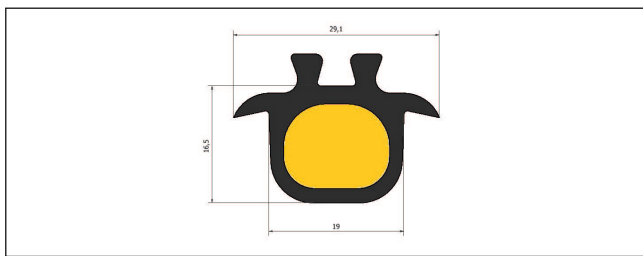


DN = d1	Profile type	b	hj -0,4/+1,2	w *)
800, 1000	DS BS 2000 18,5	70,1	18,5	12,5
1200	DS BS 2000 22	79,3	22,0	14,3
1500	DS BS 2000 22,5	86,4	22,5	17,2

*) socket gap width: gap between spigot end and socket in the main sealing area, mean value of deformation 32.5% resp. 35%

**) and larger

LOAD BALANCING ELEMENT (alle Maße in mm)



LOAD BALANCING BETWEEN SHAFT RINGS

DS TOBNORM system fulfils the requirements of DIN 4034-1 with regard to proven static and connected investigations of load capacity.

„Manholes have to be constructed under consideration of DIN EN 1610, DVWK-A 139 and DVWK-A 157. An even and not springy vertical load transfer between all manhole rings always has to be ensured. [...] The load balancing layer has to be formed in such a way that a distance between manhole rings on the inner side of the manhole is not higher than 15 mm.”

Manhole		Base ring								Spigot end					
DN = d1	t	Iso	a	b	c + 0,5	du		R1	R2	Isp	Irs	ts	h	dsp	Concrete tolerance dsp (recom./limit value)
800	120	70	13,87	24,13	32	± 0,5	878	14	14	65 -0/+2	37	26	8	890	± 1,5 / (± 2,0)
1000	120	70	13,87	24,13	32	± 0,5	1078	14	14	65 -0/+2	37	26	8	1090	± 1,5 / (± 2,0)
1200	135	80	16	28	36	± 0,5	1284,7	16	14	75 -0/+3	45	32	9	1300	± 2,0 / (± 3,0)
1500	150	90	14	32	44	± 0,5	1603,5	14	14	85 -0/+3	53	36	9	1620	± 2,5 / (± 3,5)

*) socket gap width: gap between spigot end and socket in the main sealing area, mean value of deformation 32.5% resp. 35%

**) and larger

INSTALLATION TIPS

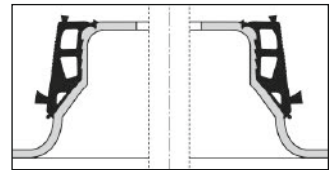
The TOBNORM system can be mounted without any problems using normal construction site equipment. During installation and handling, DIN EN 1610 and worksheet DWA-A 139 must be followed.



PRODUCTION OF THE TOBNORM MANHOLE COMPONENT (all dimensions in mm)

- Mount BS 2000 on the cleaned and lightly oiled base ring. Ensure correct seating and even pre-stretching of the sealing ring.

- Insert the load balancing element in the recess of the bottom socket and ensure that it is seated evenly.



- The sealing ring. z Before compaction fill the socket with concrete so that the seal is covered evenly by 10 cm. Then produce concrete manhole ring in the usual manner.

- After removal of the manhole ring mould, place inner and outer supporting rings on the spigot end – pressing inner ring so that the concrete is pressed against the outer support ring – and leave them there until concrete has cured.

- Pull base ring centrically, remove supporting rings.

- After the concrete has fully cured, the manhole component with the TOPNORM system is ready for installation.

When mounting the manhole ring observe the following:

- Socket area and spigot end must be clean.
- Cover thoroughly the spigot end with DS lubricant. The additional use of lubricant on the seal is recommended as this reduces the mounting forces.
- Insert the next manhole ring centrically and vertically and let it slide downwards. If necessary push slightly.

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DS⁺
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