



PATENTED PRODUCT
EU N°17180133.5
FR N°1102129

STINK-SHIELD®

VALVES

Anti-smell valves for combined sewer systems

- **Fast and easy to install** on rainwater networks, without civil engineering.
- **Adaptable** to all manhole and drain outlet configurations, etc.
- **Tested and approved** : stops 96 % of smells according to the CSTB tests.

STINK-SHIELD®

VALVES



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STINK-SHIELD®

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→ INTRODUCTION

At certain times of the year, town centres are invaded by smells coming from pavement drains.

This phenomenon may be due to :

- the presence of a combined drainage system (rainwater and wastewater).
- the drying out of siphons installed in rainwater manholes.
- variations in atmospheric pressure, which generate air flows between the inside and outside of the networks.

To stop these smells, NORHAM has developed an innovative process: **STINK-SHIELD®** anti-odour valves.

AREA OF USE

STINK-SHIELD® valves stop odours from rising, **even in dry periods**.

Several models can be adapted to the various existing drain configurations :

- **VERTICAL STINK-SHIELD® (ANTI-RODENT)** is installed inside the outlet collector, in an upright (vertical) position (p. 5-6).
- **HORIZONTAL STINK-SHIELD®** is installed at the end of the elbow, in a horizontal position (p.9).

→ LA GAMME

RÉF.	VERTICAL STINK-SHIELD®		VERTICAL ANTI-RODENT STINK-SHIELD®		HORIZONTAL STINK-SHIELD®
VISUELS					
INSTALLATION	Inside the collector at the drain outlet				On a downpipe siphon
DN	100 to 125	150 to 400	100 to 125	150 to 400	200
SCHÉMAS	 <p>VERTICAL STINK-SHIELD®</p>				 <p>HORIZONTAL STINK-SHIELD®</p>

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VALVES

→ VERTICAL STINK-SHIELD®

FROM DN 100 TO DN 125

TECHNICAL DATA

The **VERTICAL STINK-SHIELD®** anti-smell valve is available in DN 100/110 and DN 125 (for other DN, see p. 6). It can be installed in rainwater manholes, on new or existing networks, on all types of pipes and drain outlet configurations (see *How it works*, p. 7).

All references are supplied with a removable ring to adapt to the internal diameters of different pipes.

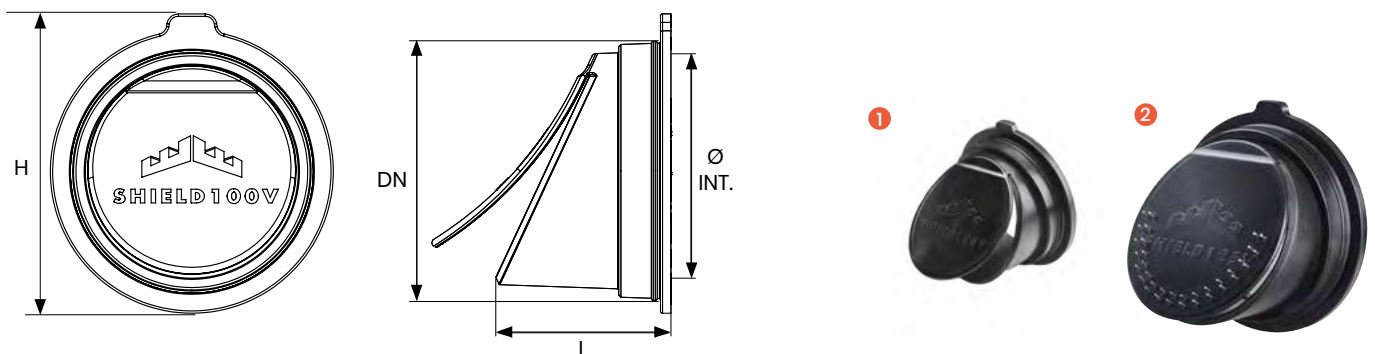
The flaps are available in a conventional version **1** and a **anti-rodent** version **2** (ref. **SHIELD***VAR**).

The anti-rodent version is fitted with steel spikes to prevent damage to the flap by rodents.



DIMENSIONS

REF. 1	ANTI-RODENT REF. 2	DN	Ø INT.	RANGES OF USE INSIDE Ø ⁽¹⁾		L	H
				MIN.	MAX.		
SHIELD100V	SHIELD100VAR	100/110	82	93,0-97,0	99,0-104,0	80	119
SHIELD125V	SHIELD125VAR	125	103	115,0-120,0	122,0-127,0	90	142



(1) The outside diameters of the flaps correspond to the range of use of the inside diameters of the pipes.

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FROM DN 150 TO DN 400

TECHNICAL DATA

The **VERTICAL STINK-SHIELD®** anti-smell valve is available from DN 150 to DN 400 (for other DN to-measure, please contact us). It can be installed in rainwater manholes, on new or existing networks, on all types of pipes and drain outlet configurations (see *How it works*, p. 7).

All product referenced are supplied with a removable ring to adapt to the internal diameters of different pipes. An expansion collar is also supplied to hold the valve inside the pipe.

The flaps are available in a conventional version **1** and an **anti-rodent** version **2** (réf. **SHIELD***VAR**).

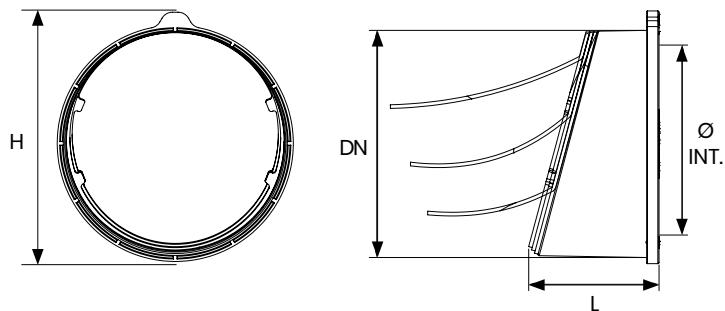
The anti-rodent version is fitted with steel spikes to prevent damage to the flap by rodents.



DIMENSIONS

REF. 1	ANTI-RODENT REF. 2	DN	Ø INT.	RANGES OF USE INSIDE Ø ⁽¹⁾		L	H
				MIN.	MAX.		
SHIELD150V	SHIELD150VAR	150	137	148,5	155	97	168
SHIELD200V	SHIELD200VAR	200	174	185,5	202,5	107	207
SHIELD250V	SHIELD250VAR	250	220	232	253	119	250
SHIELD300V	SHIELD300VAR	300	283	295	303,5	130	315
SHIELD400V	SHIELD400VAR	400	343	373	402	103	388-412*

*388 for the PVC version, 412 for the MULTI version.



Adhesive compensating strips are used for larger internal pipe diameters.

(1) The outside diameters of the flaps correspond to the range of use of the inside diameters of the pipes.

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VALVES

HOW IT WORKS

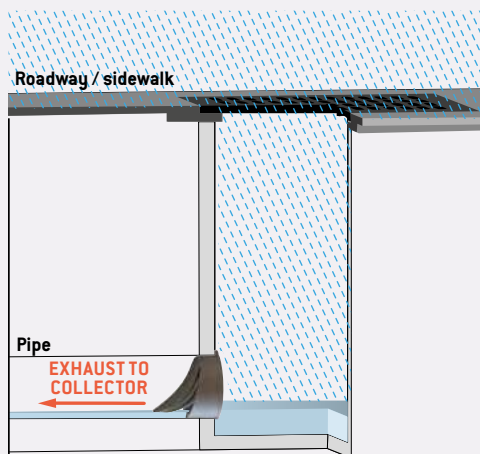


For more details on how it works, watch the video on our YouTube channel.

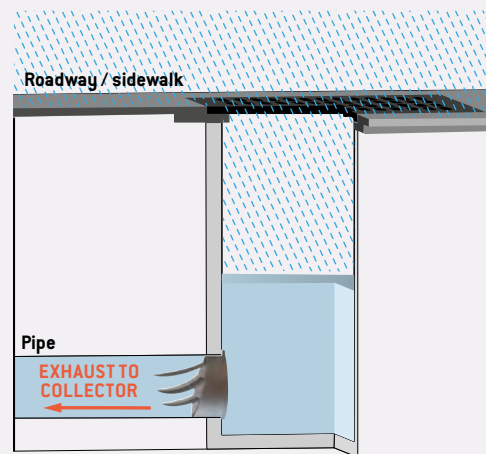
IN RAINY WEATHER: NORMAL WATER DRAINAGE

When it rains, the rainwater in the manhole rises to the level of the anti-smell valve.

Under the pressure of the water, the valve membranes open, allowing the rainwater to drain into the collector.



1. A very low flow rate allows the water to drain through the flap.

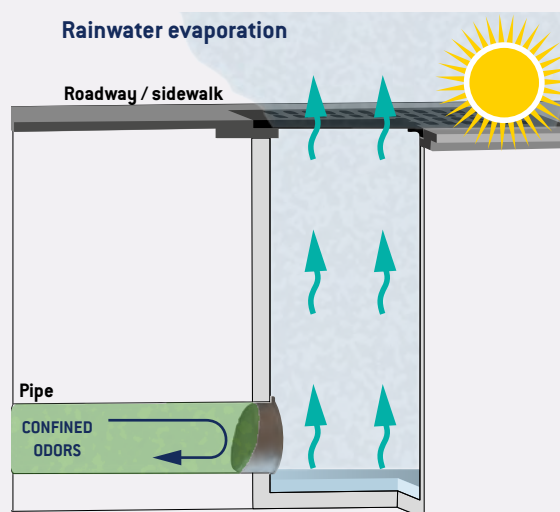


2. When the drain outlet is fully loaded, the three flap diaphragms are fully open (example for a STINK-SHIELD® ≥ DN 150).

IN DRY PERIODS: STOPS ODOURS

In dry periods, the **VERTICAL STINK-SHIELD®** anti-smell valve is in the closed position.

The membrane system makes it watertight, stopping odours rising up and remaining confined inside the collector.



Closed flap : bad smells are confined in the collector

SPECIAL CASE

For installation at the end of the rainwater drainage pipe in the collector, please contact us.

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VALVES

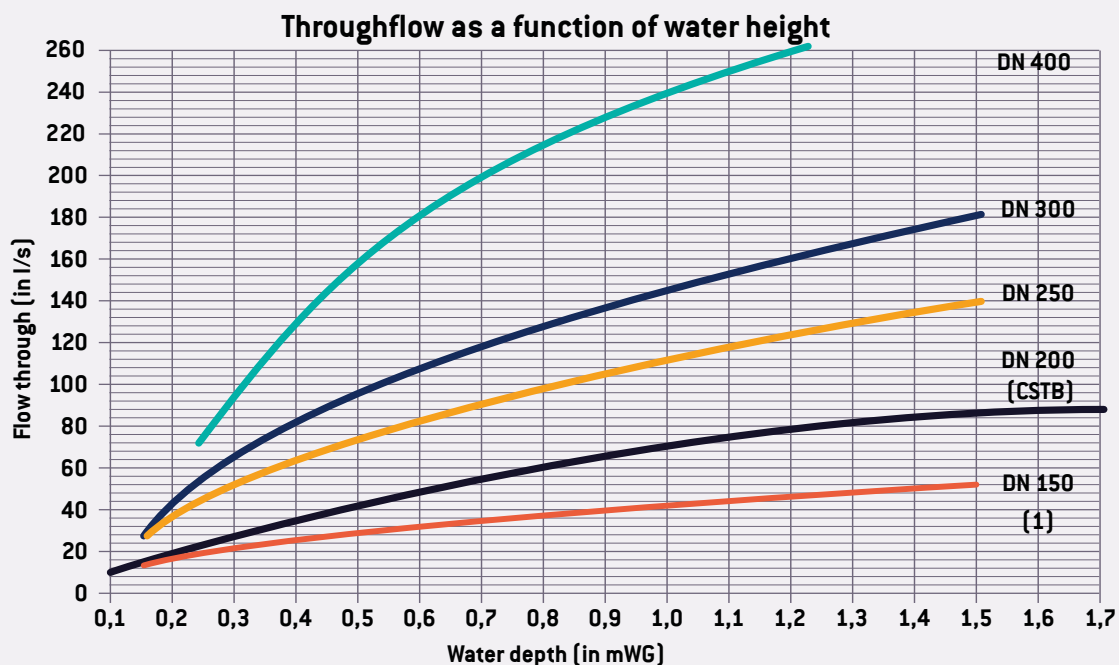
HOW IT WORKS

Tests were carried out by the CSTB (Centre Scientifique et Technique du Bâtiment / Scientific and Technical Center for Building) to establish and validate the performance of the **VERTICAL STINK-SHIELD®** anti-smell valve.

CSTB
le futur en construction

HYDRAULIC CAPACITY: THROUGHFLOW ≥ 60 L/S

- A 700 mm x 700 mm large drain grate has a maximum throughput of 60 l/s.
- The anti-smell valve must be able to evacuate a flow rate at least equivalent to that of the drain grate.
- The flap has a higher hydraulic capacity (= throughflow) when the water level in the manhole exceeds 0.8 mWG.



DN 200 : curves from tests carried out by CSTB.
AUTRES DN : curves from numerical extrapolations.
(1) DN 150 : assumption of max. of 40 l/s.

SMELL SEALING

In order to qualify its odour-tightness performance, the **VERTICAL STINK-SHIELD®** is subjected to a throughflow as it would be during a storm (see Hydraulic capacity test above). In addition, the tests are carried out with water laden with leaves, paper and cigarette butts.

A dry period is then simulated and the flow of air passing through between downstream and upstream⁽²⁾ of the flap is measured.

If a flow is observed, this corresponds to a leak.

The **VERTICAL STINK-SHIELD®** only allows a maximum of 4% of the airflow to pass through.

(2) **Downstream :** combined sewer system collector.
Upstream : rainwater manhole.

Leak test performed by the CSTB. // Report N° CAPE-AT 16-216. // Technical file on tests carried out available on request and at www.norham.fr.

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VALVES

→ HORIZONTAL STINK-SHIELD®

DN 200

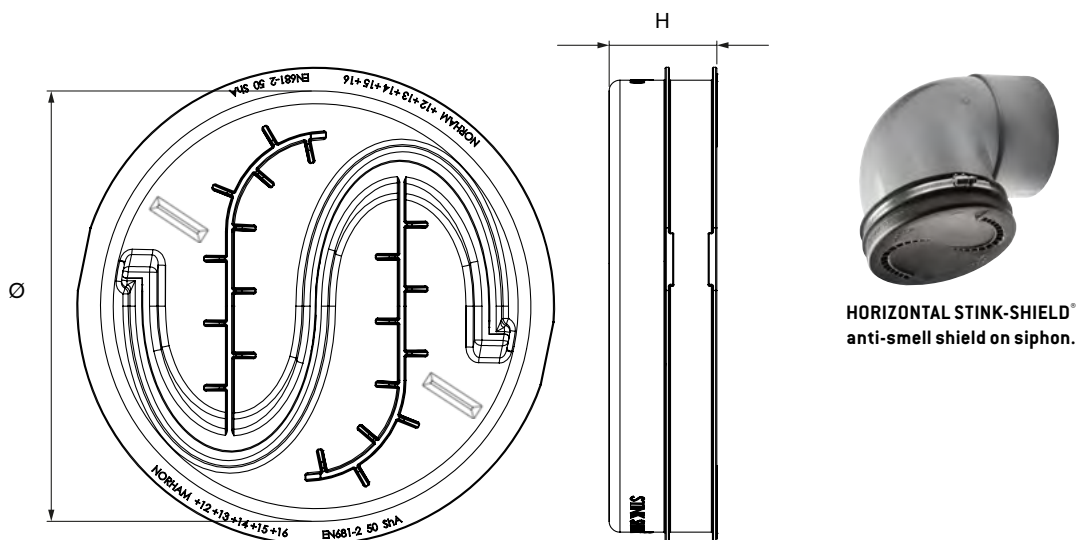
TECHNICAL DATA

During dry periods, the siphons in our street drains are no longer effective because they are no longer immersed. NORHAM has developed the **HORIZONTAL STINK-SHIELD®** anti-smell valve, available in DN 200, to take over the anti-odour function when the drain is dry.



DIMENSIONS

REF.	Ø	H
SHIELD200	200	50



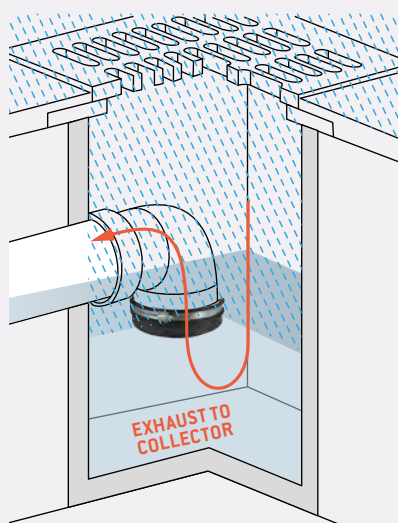
STINK-SHIELD®

VALVES

HOW IT WORKS

PAR TEMPS DE PLUIE : ÉVACUATION NORMALE DE L'EAU

When it rains, the rainwater in the manhole rises to the level of the **HORIZONTAL STINK-SHIELD®** anti-smell valve. Under the pressure of the water, the two main inlet valves open, allowing the rainwater to drain into the collector.



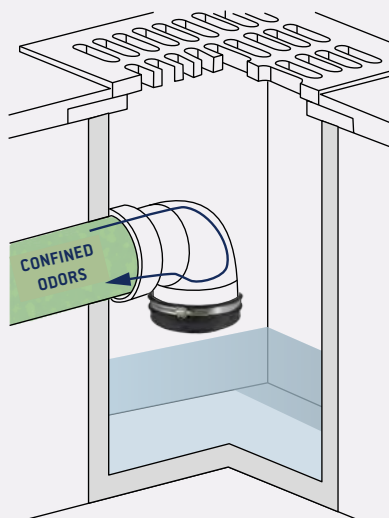
The water runs off into the collector.

IN DRY PERIODS: STOPS ODOURS

As long as the end of the siphon is submerged, unpleasant odours are stopped.

During evaporation, the water level in the manhole drops.

- When the water level rises above the valve, the secondary outlet valves open to allow residual water to drain out of the pipe. The elbow acts as a siphon.
- As soon as the water level is below the elbow, the flap is in the closed position. This prevents unpleasant odours coming from the collector from rising to the surface and contaminating the ambient air.



Bad smells are confined in the collector.

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PERFORMANCE

Tests were carried out by the CSTB (Centre Scientifique et Technique du Bâtiment / Scientific and Technical Center for Building) to establish and validate the performance of the **HORIZONTAL STINK-SHIELD®** anti-smell valve.

CSTB
le futur en construction

HYDRAULIC CAPACITY: THROUGHFLOW ≥ 60 L/S

A 700 mm x 700 mm large drain grate has a maximum throughput of 60 l/s. The flap valve must be able to evacuate at least an equivalent flow.

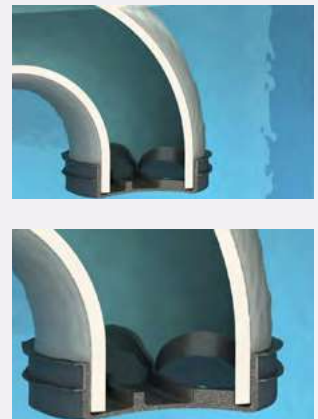
Tests show that it meets this criterion in every respect.

The **HORIZONTAL STINK-SHIELD®** even has a higher capacity when the head of water in the rainwater manhole exceeds 1.2 mCE.

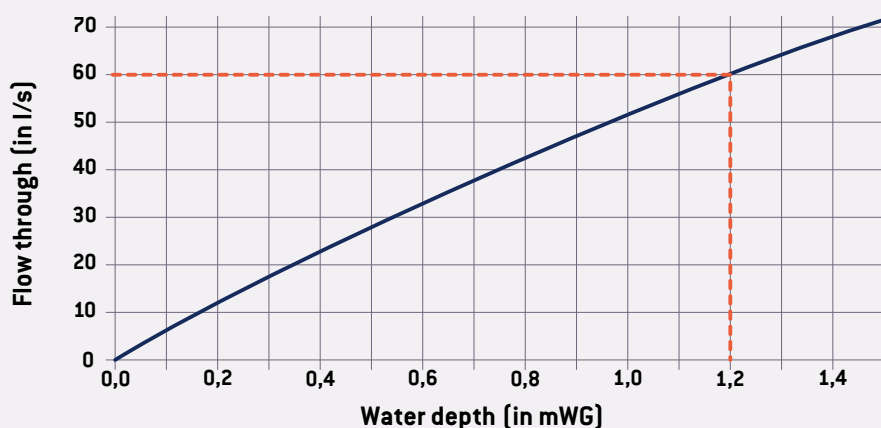
The hydraulic capacity⁽¹⁾ of the "elbow + **HORIZONTAL STINK-SHIELD®**" assembly is equivalent to that of a DN 160 pipe.

Throughflow tests carried out shown in Report No. EN-CAPE 14.170 C - V1 downloadable from www.norham.fr.

⁽¹⁾ Hydraulic capacity = throughflow.



Throughflow as a function of the water height



SMELL SEALING

In order to qualify the performance of the **HORIZONTAL STINK-SHIELD®** in making the network watertight, it was first subjected to a throughflow such as it might be during a storm. The tests were carried out with water laden with leaves, paper and cigarette butts.

A dry period is then simulated and the flow of air passing through between downstream and upstream⁽²⁾ of the flap is measured.

If a flow is observed, this corresponds to a leak.

The **HORIZONTAL STINK-SHIELD®** only allows a maximum of 1% of the airflow to pass through.



(2) Downstream : combined sewer system collector.
Upstream: rainwater manhole.

Throughflow tests carried out shown in Report No. EN-CAPE 14.021 C-V0 downloadable from www.norham.fr.

STINK-SHIELD®

VALVES

→ INSTALLATION AND USE

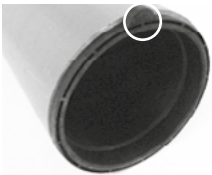

VERTICAL STINK-SHIELD®

VERTICAL STINK-SHIELD® can be installed in 4 different configurations⁽¹⁾:

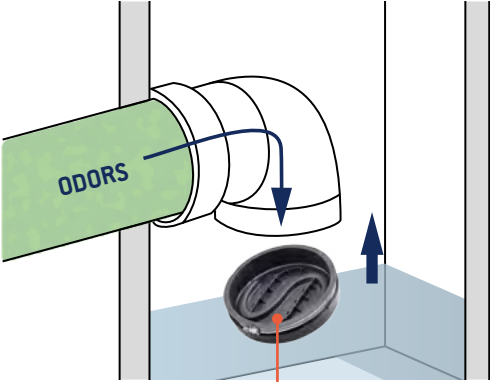
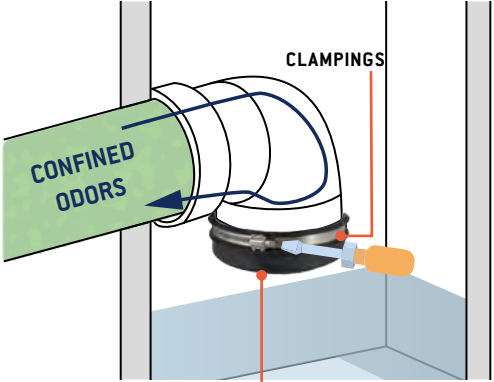
- **Configuration 1**: in a manhole with a vertical outlet (outlet at 90° perpendicular to a wall) with a break in the water flow;
- **Configuration 2**: in a manhole with an outlet level with the water course;
- **Configuration 3**: in a pipe not emerging vertically from the manhole;
- **Configuration 4**: in a manhole at gully level.

(1) Please refer to the installation instructions supplied with the valve (also available on request).

Example of installation for VERTICAL STINK-SHIELD® from DN 150 to DN 300

PHASE 1	PHASE 2
	
<p>Place the VERTICAL STINK-SHIELD® in the pipe as shown in the photo opposite.</p> <p>The VERTICAL STINK-SHIELD® is placed against the pipe wall. The position mark must be at the top.</p>	<p>Fit the expansion collar. Using pliers, follow steps 2.1 and 2.2 (photos opposite).</p> <p>The collar must press the valve against the inside of the pipe wall (2.3).</p>

HORIZONTAL STINK-SHIELD® DN 200

PHASE 1	PHASE 2
	
<p>Fit the HORIZONTAL STINK-SHIELD® valve at the end of the pipe onto the elbow in the horizontal position.</p>	<p>Tighten the clamp to the required torque. This ensures an excellent fit and a perfect seal.</p>

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→ CASE STUDIES

1 VERTICAL STINK-SHIELD® DN 150 AND 200 ANTI-SMELL FOR NANTES CITY CENTRE

	CONDITIONS
SITE	Rue de la Ville en Pierre, Nantes (44)
CHALLENGE	Ville en Pierre street in Nantes is experiencing problems with rising odours from rainwater drains. This is due to the fact that the street has a combined sewer system (rainwater + wastewater). During the summer months, the downspouts and gutters are empty, allowing odours to rise up from the collector.
RECOMMENDED SOLUTION	STINK-SHIELD® DN 150 et 200 anti-smell valves were installed in the street's rainwater downpipes and gutters to protect local residents from rising odours.



2 A CUSTOM-MADE VERTICAL STINK-SHIELD® O PROTECT LOCAL RESIDENTS FROM RISING ODOURS

	CONDITIONS
SITE	Ditch outlet, along the Roubaix canal in Leers (59)
CHALLENGE	Presence of a ditch collecting rainwater. The ditch is close to a residential area. The rainwater collected by the ditch is discharged into the municipal combined sewer system via a concrete culvert. Stale air rises up from the combined sewer system through this nozzle, creating an odour nuisance for local residents.
RECOMMENDED SOLUTION	Installation of a custom-made VERTICAL STINK-SHIELD® DN 980 odour control valve (consisting of 7 DN 300 valves) at the nozzle inlet.



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3 HORIZONTAL STINK-SHIELD® CASE STUDY AT ST DONAT SUR L'HERBASSE

	CONDITIONS
SITE	Saint Donat sur l'Herbasse (26).
INSTALLATION	On DN 200 elbow.
CHALLENGE	Unpleasant odours coming from the street gutters connected to the combined sewer system.
RECOMMENDED SOLUTION	installation of a HORIZONTAL STINK-SHIELD® anti-smell valves on a siphon bend in the downpipe.





N O R H A M



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www.norham.fr