PRODUCT ADVANTAGES

- Fast and easy to install: on rainwater networks, without civil engineering.
- Adaptable: to all kind of manholes configuration.
- Tested and approved: stops 96 % of smells according to the CSTB tests.

FAST AND EASY TO INSTALL

PATENTS
EU N° 17180133.5
FR N° 1102129

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TÉL : 33 (0) 4 75 45 00 00 - FAX : 33 (0) 4 75 45 17 05 — www.norham.fr
STINK-SHIELD®
ANTI-SMELL SHIELD / VALVES FOR UNITARY NETWORKS

ITRODUCTION
The city centers of our cities are invaded at certain times of the year by the smells coming from the pavement drains.
This phenomenon is due to:
• the presence of an unitary evacuation network;
• the drying out of the siphons installed in the storm water manholes;
• atmospheric pressure variations that generate air flows between the inside and the outside of the networks.
To stop these smells, NORHAM has developed an innovative process: the STINK-SHIELD® and STINK-SHIELD® VERTICAL anti-smell valves.

AREA OF USE
• Rainwater chute, rain boxes.

MODELS AND APPLICATIONS

TECHNICAL DATA AND REFERENCES

<table>
<thead>
<tr>
<th>Ref.</th>
<th>DN</th>
<th>Range of use Ø int. (mm)</th>
<th>W (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Multimaterial*</td>
<td>PVC*</td>
</tr>
<tr>
<td>SHIELD100V</td>
<td>100</td>
<td>99,0-104,0</td>
<td>93,0-97,0</td>
</tr>
<tr>
<td>SHIELD125V</td>
<td>125</td>
<td>122,0-127,0</td>
<td>115,0-120,0</td>
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<tr>
<td>SHIELD150V</td>
<td>150</td>
<td>148,5-151,0</td>
<td>148,5-151,5</td>
</tr>
<tr>
<td>SHIELD200V</td>
<td>200</td>
<td>199,5-202,5</td>
<td>185,5-188,5</td>
</tr>
<tr>
<td>SHIELD250V</td>
<td>250</td>
<td>250,0-253,0</td>
<td>232,0-235,0</td>
</tr>
<tr>
<td>SHIELD300V</td>
<td>300</td>
<td>297,0-301,0</td>
<td>295,0-303,5</td>
</tr>
<tr>
<td>SHIELD400V</td>
<td>400</td>
<td>396,0-402,0</td>
<td>373,0-377,0</td>
</tr>
</tbody>
</table>

*SEBS recyclable for the DN 150 à 250, EPDM for the DN 100, 125, 300 and 400.
*Configuration for PVC pipes: remove the ring. For other materials: keep the ring.
**PRINCIPLE OF OPERATION**

**IN RAIN WEATHER: NORMAL EVACUATION OF WATER**

During rainfall, the rain water level rises to the level of the STINK-SHIELD® VERTICAL anti-smell valve.

Under the effect of the thrust of water, the membrane opens and allow the rainwater to drain to the collector.

1. Very low flow allows evacuation through the anti-smell valve.
2. When the drains are fully loaded, the 3 membranes of the STINK-SHIELD® VERTICAL are totally open.

**PER DRY PERIOD: STOPS ODORS**

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

The set of membranes makes the seal, stops the rise of smells that remain confined inside the collector.

**PARTICULAR CASE**

Installation at the outlet of the rainwater drainage pipe in the collector, consult us.
PERFORMANCE

Tests were carried out by the CSTB (Scientific and Technical Center of Building), in order to establish and validate the performance of the anti-smell valve STINK-SHIELD® VERTICAL.

HYDRAULIC CAPACITY: THROUGHPUT ≥ 60 l/s

A 700 mm x 700 mm large drain grid has a maximum throughput of 60 l/s. The STINK-SHIELD® VERTICAL must be able to evacuate a flow rate at least equivalent to the drain grid. The valve has superior hydraulic capacity* when the water level in the manhole exceeds 0,8 mWC.

![Graph showing Troughflow according to the water level](image)

*DN 200: curves resulting from tests carried out by the CSTB. // Other DN: curves from numerical extrapolations. // *DN 150: max flow gate flow rate assumption of 40 l/s.

SMELL SEALING

In order to qualify its smell-sealing performance, the STINK-SHIELD® VERTICAL is subjected to a through-flow such as it could be during a stormy period (see hydraulic capacity test). In addition, the tests are performed with water loaded with leaves, paper, cigarette butts.

A dry period is then simulated and the flow of air passing between the downstream and the upstream* of the STINK-SHIELD® VERTICAL is measured. If a flow is found, this corresponds to a leak.

The STINK-SHIELD® VERTICAL only allows up to 4 % of the airflow.

*Downstream = unitary network collector; upstream = rain water manhole. // Leak test performed by the CSTB. // Report N° CAPE-AT 16-216. // Technical file relating to the tests carried out on request and on www.norham.fr.

INSTALLATION

The STINK-SHIELD® VERTICAL adapts to all types of pipes and manhole configurations and is installed:
• at the entrance of the rain water evacuation network;
• in abutment, it is held in place thanks to its expansion collar. It can be removed at any time for inspection or maintenance.

For installation on a drain outlet manifold that is not perpendicular to the wall, the stop ring must be cut (predefined zone) and the expansion clamp installed.

PARTICULAR CASE

Installation on a drain outlet collector that is not perpendicular to the wall, the stop ring must be cut (predefined zone) and the expansion clamp installed.
In dry weather, the elbows (siphons) that equip the drains of our streets are no longer effective because they are no longer immersed. To relay the anti-smell function when the drain is dried, NORHAM has designed an innovative process: the STINK-SHIELD® anti-smell valve.

**TECHNICAL DATA**
- **Body:** recyclable elastomer type SEBS;
- **clamp:** stainless steel AISI 304;
- **DN:** 200 mm.

**OPERATING PRINCIPLE**

**IN RAINY WEATHER: NORMAL EVACUATION OF WATER**
- During rainfall, the rainwater manhole rises to the level of STINK-SHIELD®;
- under the effect of the thrust of water, the two main ears of the STINK-SHIELD® open and allow the rainwater to drain to the collector.

**BAD SMELLS ARE CONFINED IN THE COLLECTOR**

**BY DRY PERIOD: STOP SMELLS**
During evaporation, the water level decreases in the manhole.
- When the water level is above the STINK-SHIELD®, the secondary ear open to allow the residual water to drain out of the pipe. The elbow still acts as a siphon;
- as soon as the water level is below the elbow, the STINK-SHIELD® is in the closed position. It prevents bad smells from the collector, rising to the surface and vitiating the ambient air.
PERFORMANCE

Tests have been carried out by the CSTB (Scientific and Technical Building Center) to establish and validate the performance of the STINK-SHIELD® anti-smell valve.

FLOW THROUGH ≥ 60 l/s

A large drain grid 700 mm x 700 mm has a maximum through flow of 60 l/s. The valve must allow to evacuate a flow at least equivalent. Tests show that it meets this criterion in every respect.

The STINK-SHIELD® even has a higher capacity when the water level in the rainwater manhole exceeds 1,2 mCE

The hydraulic capacity* of the «elbow + STINK-SHIELD®» assembly is equivalent to that of a DN 160 mm pipe.

Throughflow tests carried out by the report N° EN-CAPE14.170 C-V1 downloadable on www.norham.fr.

*Hydraulic capacity = throughout.

SMELL SEALING

In order to qualify the performance of the STINK-SHIELD® to make the network watertight, it was first subjected to a through flow as it could be during a stormy period. The tests were performed with water loaded with leaves, paper, cigarette butts.

A dry period is then simulated and the flow rate of air passing between the downstream and the upstream* of the STINK-SHIELD® is measured. If a flow is found, this corresponds to a leak.

STINK-SHIELD® only allows a maximum of 1 % of the air flow.

Leak tests carried out by the report N° EN-CAPE14.021 C-V0 downloadable on www.norham.fr.

*Downstream = rainwater network collector; upstream = rainwater manhole.

INSTALLATION

The STINK-SHIELD® anti-smell valve is installed at the end of the network in a horizontal position in all rainwater manhole equipped with a 200 mm diameter PVC elbow (or capable of receiving a DN 200 elbow).

Installation is quick and easy with a hose clamp. Its assembly requires only a screwdriver.
## STINK-SHIELD® VERTICAL CASE STUDIES

### STUDY N°1

**CONDITIONS**

<table>
<thead>
<tr>
<th>Site</th>
<th>Saint Pierre de Maillé (Vienne, France).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation</td>
<td>On collectors DN 160 and DN 200.</td>
</tr>
<tr>
<td>Problem</td>
<td>Rising smells coming from the gutters of the street.</td>
</tr>
<tr>
<td>Recommended solution</td>
<td>Installation of STINK-SHIELD® VERTICAL anti-smell valve at the outlet of the drain.</td>
</tr>
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</table>

### STUDY N°2

**CONDITIONS**

<table>
<thead>
<tr>
<th>Site</th>
<th>Sisteron (Bouches du Rhône, France).</th>
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<tbody>
<tr>
<td>Installation</td>
<td>On collectors DN 200 and DN 315.</td>
</tr>
<tr>
<td>Problem</td>
<td>Rising smells coming from the gutters of the street.</td>
</tr>
<tr>
<td>Recommended solution</td>
<td>Installation of STINK-SHIELD® VERTICAL anti-smell valve at the outlet of the drain.</td>
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</table>
### STUDY N°1

**CONDITIONS**

<table>
<thead>
<tr>
<th>Site</th>
<th>Saint-Donat sur l’Herbasse (Drôme, France).</th>
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</thead>
<tbody>
<tr>
<td>Installation</td>
<td>On elbow DN 200.</td>
</tr>
<tr>
<td>Problem</td>
<td>Rising smells coming from the gutters of the street.</td>
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<tr>
<td>Recommended solution</td>
<td>Installation of STINK-SHIELD® anti-smell valve on the elbow in the drain.</td>
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</table>

### STUDY N°2

**CONDITIONS**

<table>
<thead>
<tr>
<th>Site</th>
<th>Marseille (Bouches du Rhône, France).</th>
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<tbody>
<tr>
<td>Installation</td>
<td>On elbows DN 200.</td>
</tr>
<tr>
<td>Problem</td>
<td>Rising smells coming from the gutters of the street.</td>
</tr>
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<td>Recommended solution</td>
<td>Installation of STINK-SHIELD® anti-smell valve on the elbow in the drain.</td>
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