# **10 facts** for successful soil & waste noise reduction

**It's time to take control of sound in soil and waste systems**

wavin

# Living up to expectations **is no coincidence** – and that's a fact

**At Wavin, we know choosing the right pipe solutions for your projects is never easy, especially when you are considering low-noise soil and waste pipes. We also know that these soil and waste pipes are only one part of every new-build. With increasing noise regulations and more complex customer and end-user demands, it's clear that relying only on past experiences in previous builds is not always the ideal solution.**

We've been working hard to make the selection process easier for you. By extensively researching and developing the properties of sound and pipe materials, we can safely say that increasing noise reduction and improving overall system performance when working with Wavin is no coincidence.

The following 10 facts outline how not all systems are created equal and will help you control the sound of soil and waste systems.

**Table of contents**


**3** Key sources of wastewater noise – an introduction

**4** Facts about noise-reduction material

**6** Facts from the end-user's perspective

**8** Facts about airborne and structure-borne sound

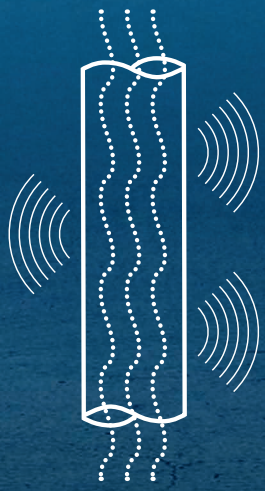
**10** Facts about the Fraunhofer tests

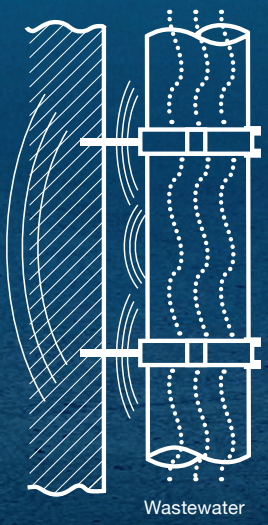
**11** The SoundCheck Tool


For more information on Wavin's noise reducing solutions, please contact your local Wavin representative.

# **Key sources**
# of wastewater noise

Are you looking at the right data when choosing low-noise soil and waste pipes? To choose the right product, you need to know the difference between airborne and structure-borne sound.




**Airborne sound** is the amount of noise from water passing through a pipe that can be heard if standing in the same room in which the pipe is installed

**Structure-borne** sound is the amount of noise that can be heard from the pipe after the noise has permeated through pipe supports, brackets and walls

Measurements for structure-borne sound look good on paper as they are often much lower than airborne sound, and lower than the official noise requirements set in building codes. But using structure-borne figures only, does not guarantee that your building project is fully compliant. As well as the pipe itself, pipe supports, wall brackets and wall materials all have considerable influence on noise. When using structure-borne sound as the benchmark for choosing a particular low-noise system, you run the risk of choosing a solution that cannot meet the requirements. You might even be required to replace the pipes or provide additional noise insulation afterwards, which takes time and money.

That’s why when designing low-noise soil and waste solutions, it’s crucial to think system, not just pipe.

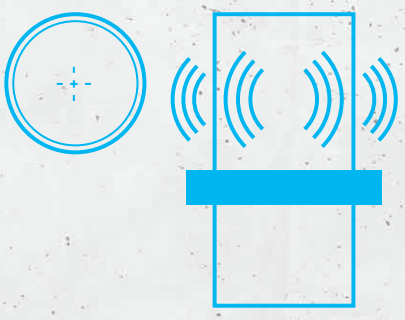
# Facts about **noise-reduction materials and components**

**The composition of soil and wastewater pipes is central to the pipe's noise reduction capabilities. Four key features of material and component choice account for the biggest impact on noise reduction.**

## Fact #1

**Compared to thin-walled pipe systems, mineral-filled plastic pipes decrease sound drastically.**
Material density and wall thickness play central roles in noise minimisation. The right material composition improves noise and offers optimal sound reduction.

**Material comparison**



Standard thin-walled pipe system
(density = 0.9 kg/cm$^3$;
wall thickness = 2 mm)

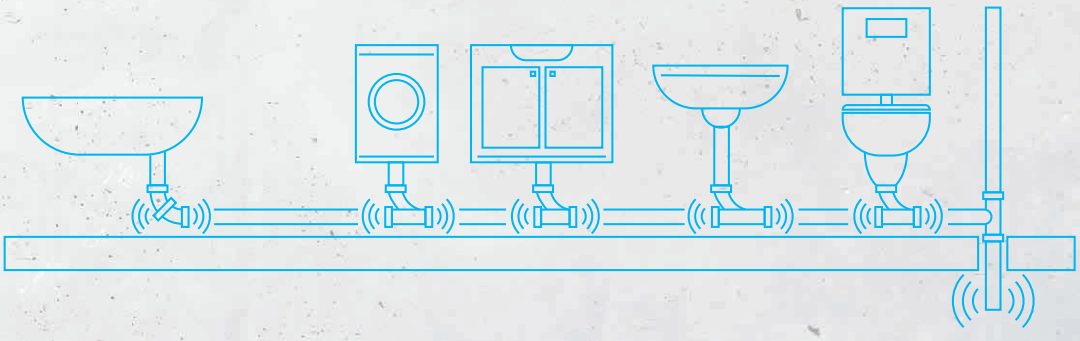
Mineral-filled (low noise) plastic pipe –
Wavin AS+ (density = 1.90kg/cm$^3$;
wall thickness = 5.3 mm)

## Fact #2

**A good system bracket is half the job done.**
The vibrations caused by flowing water are transmitted via the pipe bracket to the walls. Flexible materials in the bracket absorb these vibrations and thereby have a significant influence on how much noise from the pipe is reduced.

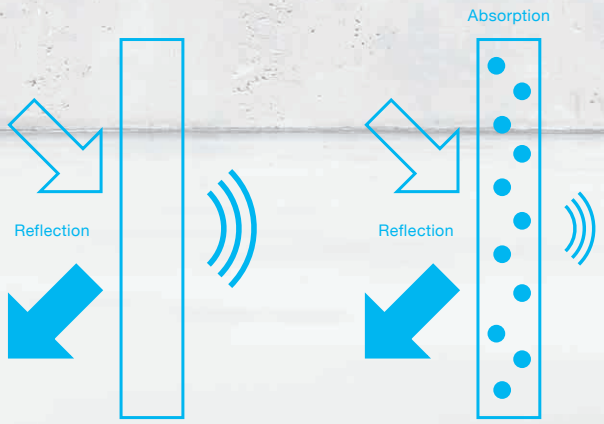
## Fact #3

**The thicker and the heavier the pipe is, the more sound it absorbs**.
There are usually many directional changes in soil and waste systems and these can cause noise. Increasing the mass of plastic pipes and connections means they become heavy enough to provide good sound absorption.



## Fact #4

**The material composition of pipes influences how much noise is absorbed.**
Flexible materials absorb vibrations caused by flowing water.



# Facts from
# **the consumer's perspective**

**New homeowners don't get to choose the soil and waste pipes used in their property and tend to concentrate on interior fittings like tiles, kitchens etc. This means many end up with a suboptimal solution, one that doesn't perform when it comes to reducing noise. Had they known, the homeowners would have been willing to purchase a better solution because that's when they realise a pipe is not just a pipe.**

## FACT #5

**Urbanisation creates noise pollution.**
Over half of the world's population now lives in urban areas. In fact, a city the size of Paris is created every week.* Noise pollution (even indoors) is a side effect and can affect physical and mental health and cause sleeping problems.

## FACT #6

**People in urban areas are willing to pay for more comfort and silence.**
The great potential for noise pollution in urban areas means people seek silence and comfort in the places they live and work.

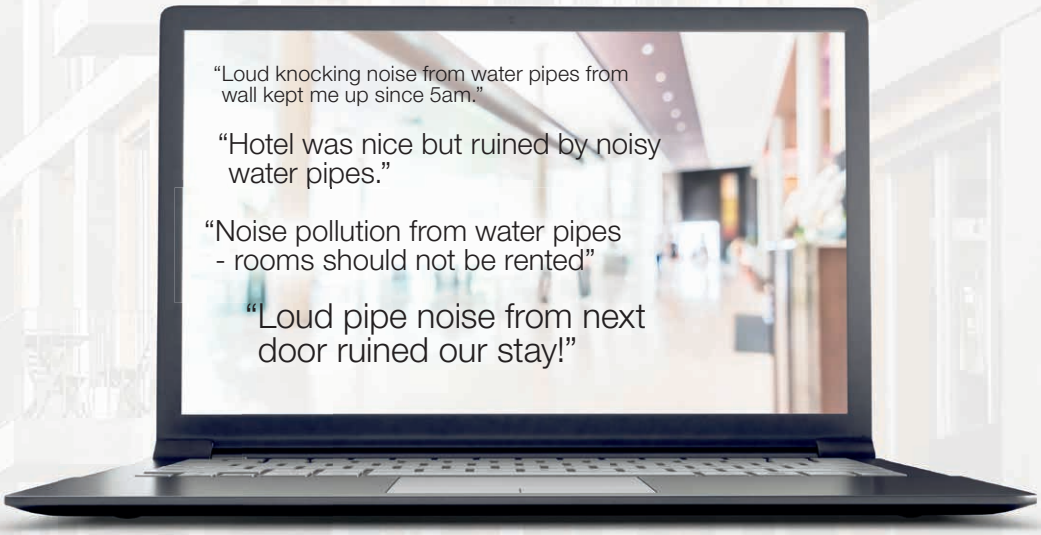
*Source: United Nations – World Urbanisation Prospects (2014)

## FACT #7

**The average person is willing to pay  400 to ensure a silent apartment.** For a single apartment, the cost of upgrading a soil & waste system to a high-spec low noise system is around just €400.

## Did you know?

Pipe noise in hotels is a common reason for poorly rated hotels on TripAdvisor.



# Facts about
# **airborne and structure-borne sound**

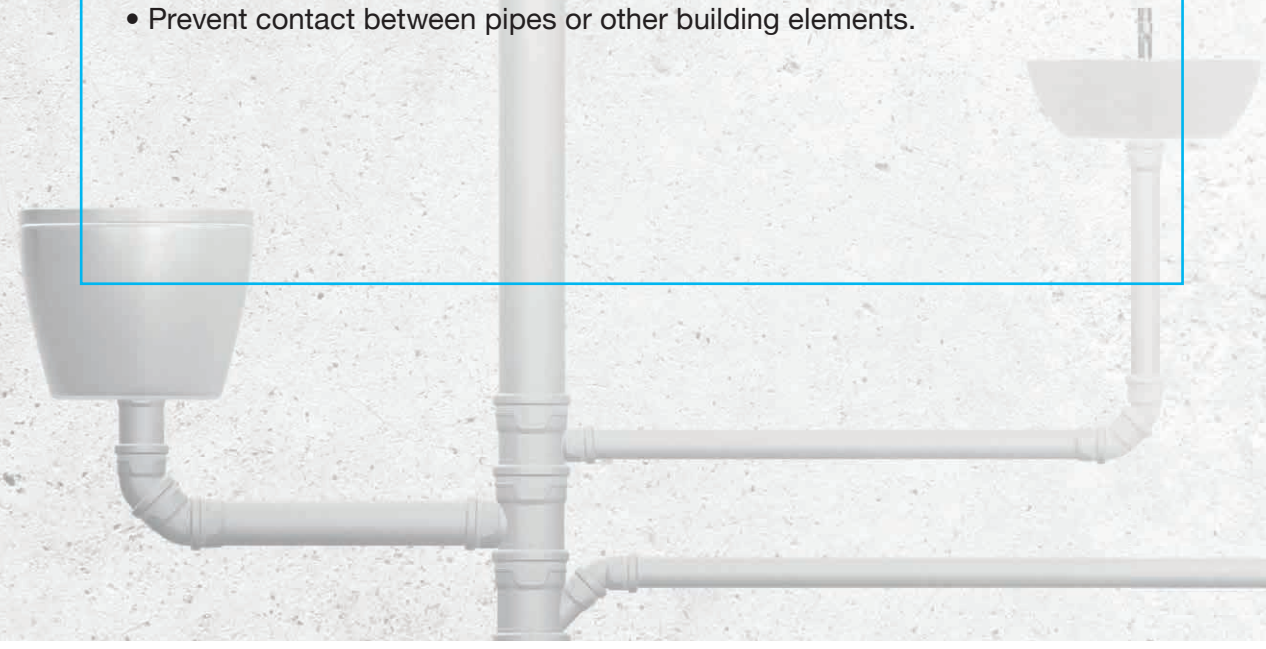
**Every small action you take adds up to noise reduction for the entire solution. That's why when designing low-noise soil & waste solutions it's crucial to think system (pipe, fitting, brackets), not just pipe.**

## Fact #8

**Structure-borne sound depends on multiple factors.**
Pipe supports, wall brackets and wall materials – all have considerable influence on how much noise from the pipe is reduced.

**How you can reduce structure-borne sound:**

- Fix the pipe system to a heavy wall (preferably >222kg/m$^2$). If a shaft is used, connect pipe to the construction wall and not to the shaft.
- Install brackets like the Wavin AS+ with rubber inlays and damper between the threaded rod and the wall.
- Fix the pipe – if possible – at a point on the wall either close to the floor or the ceiling (due to mass).
- Don't place brackets in areas where sound production is high, such as bends.
- Prevent contact between pipes or other building elements.

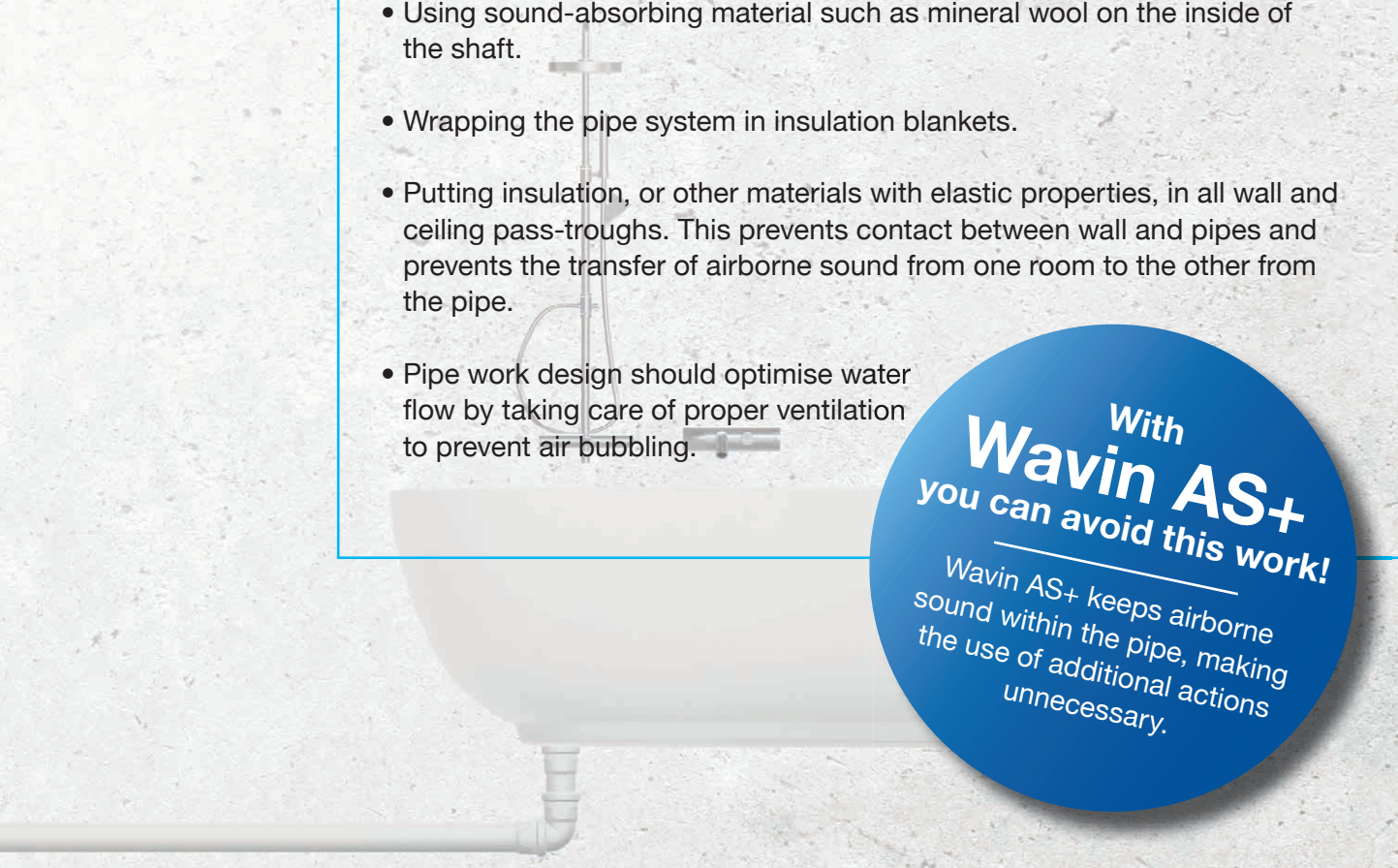


## Fact #9

**Airborne sound can be used to compare pipes, but not systems.**
The noise that the pipe emits itself will be the same, no matter how it is installed. This makes airborne sound a reliable way of comparing different pipes. However, for the best acoustic performance you need to think system – and look at structure-borne sound too.

**Usually, airborne sound is reduced by a number of work- and material-intensive tasks:**

- Creating a high-mass shaft wall between pipe and room reduces airborne sound.
- Using sound-absorbing material such as mineral wool on the inside of the shaft.
- Wrapping the pipe system in insulation blankets.
- Putting insulation, or other materials with elastic properties, in all wall and ceiling pass-troughs. This prevents contact between wall and pipes and prevents the transfer of airborne sound from one room to the other from the pipe.
- Pipe work design should optimise water flow by taking care of proper ventilation to prevent air bubbling.



**With Wavin AS+ you can avoid this work!**

Wavin AS+ keeps airborne sound within the pipe, making the use of additional actions unnecessary.

# Facts about
# **the Fraunhofer test**

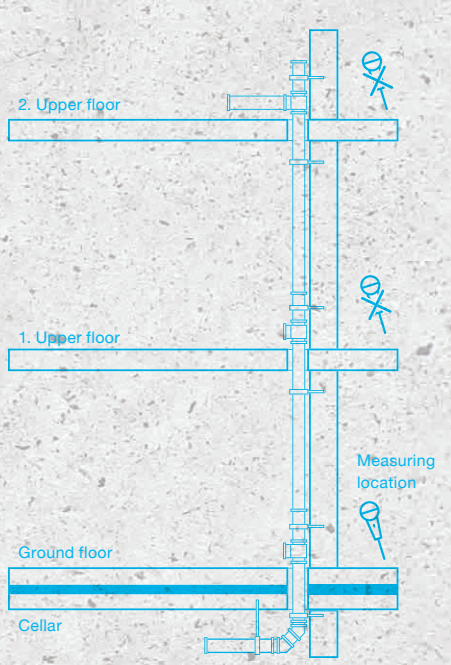
**The vast majority of soil and waste pipes are tested in impartial test laboratories – in many cases at the Frauenhofer Institute in Germany. The pipes are installed in a test building to ensure uniform testing methods and give an indication of potential sound issues. But because the results from the Frauenhofer reports are taken from that test environment with specific building materials, the structure-born sound results cannot be used as a direct indicator of structure-borne sound in any building.**

**To complement the Fraunhofer test, Wavin has developed the SoundCheck Tool which enables you to calculate your system's noise level based on individual parameters.**

## Fact #10

**A realistic estimation of noise level requires you to consider many parameters.**
To determine the real level of pipe system noise emissions in a room, you need a dynamic way of calculating noise level aligned to specific parameters:

- Pipe system characteristics
- Building design
- Shaft characteristics
- Suspended ceiling criteria
- Structural characteristics of the building
- Flow parameters
- Installation requirements
- Insulation requirements

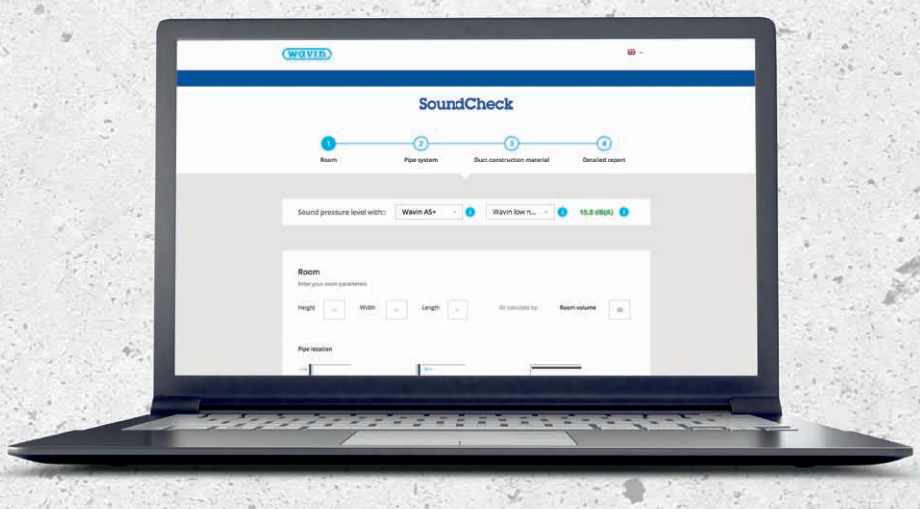



**Example:**

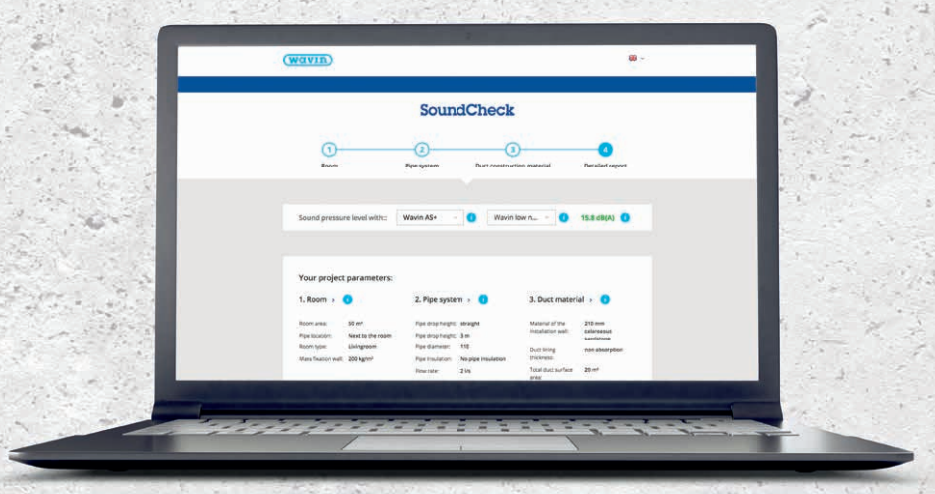
| **Product** | **Airborne**<br>Flow rate 2.0 l/s | **Structure-borne**<br>Flow rate 2.0 l/s |
|---|---|---|
| Wavin AS+<br>with Wavin system brackets | 48 db(A) | < 10 db(A) |

Wavin's low-noise pipes (including the Wavin AS+ bracket system) have the above-mentioned noise level at a flow rate of 2.0 l/s. The requirement for noise in buildings is usually 30dB(A). Airborne sound can be reduced to meet that requirement. For instance, installing the Wavin AS+ behind a 13 mm plasterboard will reduce the noise by 20dB(A) to reach a level of 28dB(A) and meet the requirement.

# Get the facts on noise levels with **the Wavin SoundCheck Tool**

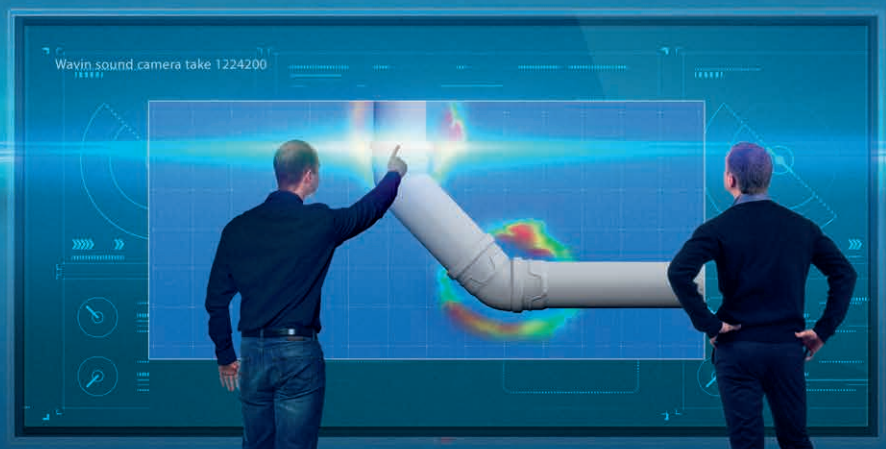



With noise regulations continuously being updated, calculating noise levels to ensure your design meets requirements can be a complex exercise. Wavin's online SoundCheck Tool is designed to relieve some of that stress.




Unique to Wavin, the SoundCheck Tool simulates the system acoustics of your installation and calculates noise levels based on individual parameters. In just four clearly defined and intuitive steps, you can get the answers you need to see if your design meets regulations.

# Introducing the new Wavin AS+




# **Ultimate noise reduction and high-level performance** is no coincidence

The new Wavin AS+ has been designed to meet the needs of engineers and installers. On top of 30 years of experience, we spent many hours on noise level testing, explored new materials and invested heavily in developing a seal with integrated lubricant lowering push-in forces. This is why we can confidently say that the ultimate noise reduction and super-easy installation delivered by the new Wavin AS+ is no coincidence.

orbia
Advancing life together

wavin

Wavin operates a programme of continuous product development, and therefore reserves the right to modify or amend the specification of their products without notice. All information in this publication is given in good faith, and believed to be correct at the time of going to press. However, no responsibility can be accepted for any errors, omissions or incorrect assumptions.



**Wavin Limited** | Registered Office | Edlington Lane | Doncaster | DN12 1BY | Tel. 0844 856 5152 | www.wavin.co.uk | info@wavin.co.uk

December 2019