GEBERIT

WHITE PAPER 2021

A SOUND **SOLUTION**

THE IMPACT OF WASTE WATER ON BUILDING DESIGN AND THE NEED TO CHALLENGE UK PERCEPTIONS AROUND ACOUSTIC PERFORMANCE.

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GEBERIT'S ACOUSTICS LABORATORY

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NOISE MATTERS. MANY OF US HAVE COMPLAINED ABOUT BEING KEPT AWAKE AT NIGHT BY WASTE WATER DRAINAGE FROM ADJOINING ROOMS EITHER IN THE HOME OR A HOTEL. BUT DESPITE THIS, NOISE (AND SPECIFICALLY NOISE FROM THE BATHROOM) REMAINS LOW ON THE AGENDA WHEN IT COMES TO SETTING STANDARDS FOR THE QUALITY OF NEW BUILDINGS IN THE UK.

This white paper examines the current regulations which govern the selection and specification of acoustically-optimised product solutions, highlighting the flaws which are evident in British Standards and UK Building Regulations.

It also assesses the suitability of current testing procedures for sound insulation, challenging why the UK still lags behind our European counterparts when it comes to supporting designers and consultants in specifying the most appropriate solutions for each individual project and room.

For many people, home is the one true sanctuary away from the commotion of modern life. It is a place to escape, to truly unwind and to restore the senses. But too often, the built environment is contributing to the noise which blights our everyday lives.

The continued development of acoustically-optimised solutions provides an opportunity to support that notion, improving wellbeing and optimising environments. However, we need change in order to grasp that opportunity. Geberit presents the case for defining new UK standards.

WHAT IS **NOISE?**

No, you are not just imagining it; the world is getting noisier. More machines, more people, more technology and increased travel is contributing to unprecedented global noise pollution. Many believe noise could be the next major public health crisis, particularly with continuing urban sprawl.

Sensitivity to noise and noise perception are subjective

Different people respond to sound in different ways. Often, it is not the volume of noise that is the key factor in determining whether someone reacts positively or negatively, but the type of noise involved. The best example of this is that a dripping tap (extremely low sound level) can be more annoying than loud music (high sound level) at a rock concert. The difference between sound (pleasant) and noise (unpleasant) is that noise is always what someone else is making and not what I myself am doing (sound).

The World Health Organisation, which has been tracking noise levels for over a decade, describes noise pollution as an “underestimated threat” that contributes to everything from stress to high blood pressure, cardiovascular disease, dementia, diabetes, and of course, hearing loss.

And the issue is not restricted to the outside world. Rapidly increasing numbers of connected devices, poor end-user awareness and lack of clarification in UK standards and Building Regulations can leave many of us unable to shake off the effects of unwanted noise inside buildings too. Things clearly need to change.

We must mitigate the impact of noise. As an extended specification and installation chain, we can make better-informed decisions to help reduce noise in buildings and its subsequent impact on wellbeing, particularly in multi-occupancy residential properties.

UNDERSTANDING **NOISE**

The science behind sound appears straightforward. Sound moves through the air in waves and when a sound wave reaches our ear, we perceive its pressure as a certain loudness and its frequency as a certain pitch. The higher the sound, the higher the frequency, and the louder the sound, the greater the acoustic pressure.

HOWEVER, MEASURING NOISE AND ITS IMPACT IS NOT SO SIMPLE.

From a physical standpoint, the acoustic noise which reaches our ears is a vibration of air molecules, which produces small pressure fluctuations in the ear. The intensity of acoustic noise is thus indicated by fluctuations in air pressure. Because these fluctuations cover a range of between one and one billion, we express the acoustic noise level on a logarithmic scale, called the decibel unit (dB).

Our hearing is at its most sensitive at a frequency of 1-5 kHz and, within this range, we are able to perceive sounds with a lower acoustic pressure level of 0 dB. In other frequency ranges, however, sounds do not become audible until they reach approximately 20 dB. Frequency filters are used to simulate this perception of loudness. In the case of measuring instruments, this normally takes the form of an A-weighting filter, which reduces the instrument's sensitivity at low sounds. The measured values are specified in dB(A).

Above 40 dB(A), a decrease or increase in the acoustic noise level of 10 dB(A) is perceived as the loudness doubling or halving. If multiple sound sources are present at the same time, something more than a simple addition calculation is required to calculate the total sound pressure level. In this instance, energetic addition must be used.

For example, let's say there is a ticking clock, the sound of noisy waste pipes and traffic noise all taking place at once during the night. In this case, we would carry out the following calculation:

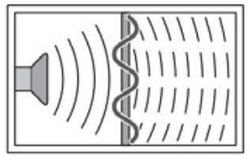
- clock ticking: 20 dB(A)
- night-time quiescent level: 26 dB(A)
- sound of pipes in the building: 28 dB(A)
- traffic noise: 30 dB(A)

$$L = 10 \times \log(10^{2.0} + 10^{2.6} + 10^{2.8} + 10^{3.0}) = 33.3 \text{ dB(A)}$$

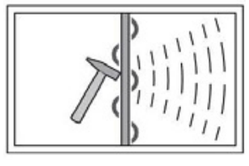
AIRBORNE AND STRUCTURE-BORNE SOUND

Another consideration is that sound is transmitted both through the air and by means of wall and ceiling vibrations. In the latter case, we refer to structure-borne sound. Encapsulation can reduce the extent to which airborne sound is transmitted; for example, by enclosing components in sound-insulating product materials. To prevent structure-borne sound propagation, the individual components must be kept apart from one another. Elastic connections or insulating layers may be used for sound insulation purposes, but structure-borne sound insulation must cover the entire area, as even a single sound bridge can negate its effect altogether.

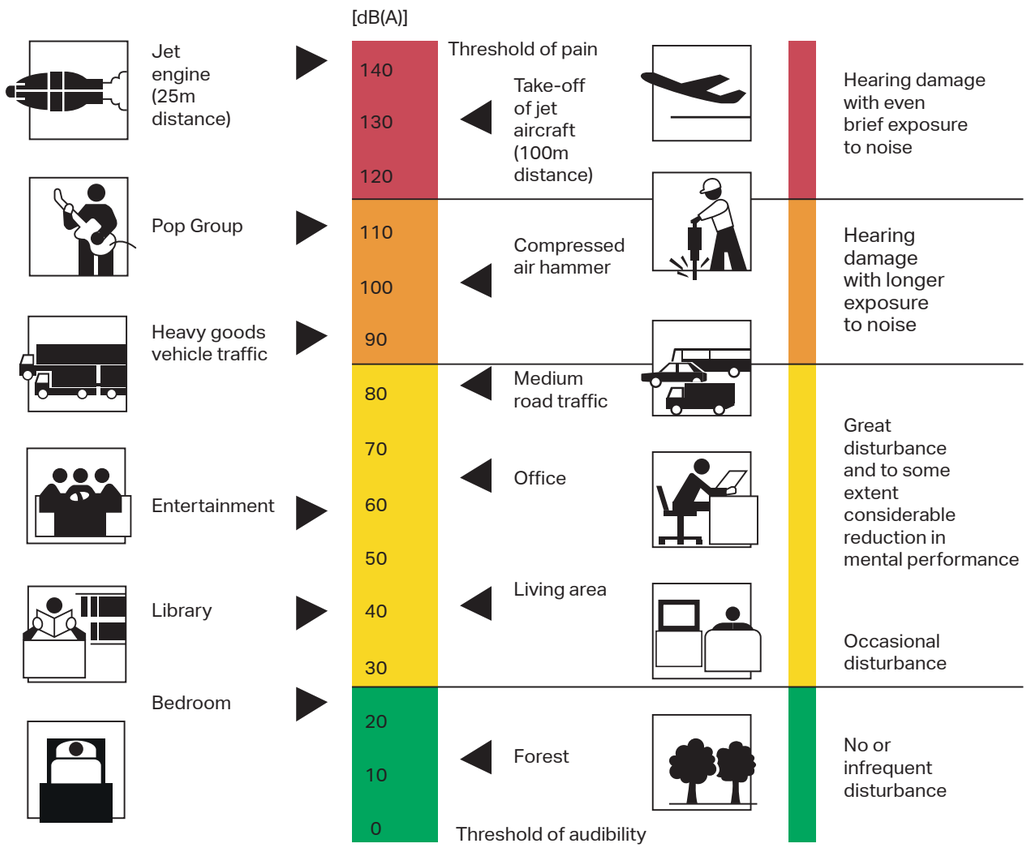
Airborne sound propagation



Structure-borne sound propagation



→ **THE SOUND OF SOCIETY** SOUND PRESSURE LEVELS OF DIFFERENT SOUND SOURCES:



DID YOU KNOW?

THE NOISE LEVEL ON TEN SEPARATE JOURNEYS IN ZONES 1 AND 2 OF THE LONDON UNDERGROUND GOES ABOVE 105 DECIBELS. THAT'S LOUDER THAN A HELICOPTER TAKING OFF NEARBY.

Dr Joe Sollini, of University College London's Ear Institute, said: "If someone was on a noisy Tube line every day for long journeys, it is perfectly possible this could increase the risk of hearing loss and potentially tinnitus."

Under health and safety law, employers must offer hearing protection if there are any sounds in a workplace at or above an average 85 decibels over an eight-hour period.

(Findings from BBC Inside Out London)

ARE YOU ASKING **THE RIGHT QUESTIONS?**

In building design, internal acoustics is mainly concerned with heating, ventilation and air conditioning, with little or no consideration given to drainage. Even the relevant standards on building noise mainly centre on mechanical noise from HVAC equipment, with very limited information or guidance in UK regulations on the impact of noise from public health services such as waste water.

HOWEVER, RESEARCH SHOWS THAT BUILDING OCCUPIERS AND USERS ARE IMPACTED BY BATHROOM NOISE. IN A YOUGOV POLL COMMISSIONED BY GEBERIT, IN MARCH 2021 MORE THAN A QUARTER (26%) OF HOMEOWNERS SAY THEY ARE REGULARLY AFFECTED BY BATHROOM SOUNDS INCLUDING THE TOILET FLUSHING, DRAINAGE AND PIPES.

The industry must change its mindset. Building designers, specifiers and M&E contractors must take a whole-building approach - to extend the scope of noise simply beyond HVAC and consider the choices required to deliver a full system approach to reducing building noise. cars, coffee machines and construction plants. But how many of us are protected from acoustic interference even within our own homes? How many consumers are even aware of products and solutions to support in reducing noise?

THE IMPACT OF SOUND

IN THE FAST-PACED, 'ALWAYS-ON' SOCIETY IN WHICH WE LIVE, THE HOME IS OFTEN THE ONE TRUE RETREAT AWAY FROM NOISY CARS, COFFEE MACHINES AND CONSTRUCTION PLANT.

DESPITE THIS, RESEARCH COMMISSIONED BY GEBERIT IN 2020 SHOWED THAT 70% OF HOMEOWNERS WERE NOT EVEN AWARE OF ANY LEGAL REQUIREMENT OR REGULATIONS SURROUNDING ACOUSTICS IN THE HOME.

SPECIFIERS AND CONTRACTORS MUST BE ASKING THE RIGHT QUESTIONS WHEN IT COMES TO PRODUCT SPECIFICATION, TO PROVIDE BETTER OUTCOMES FOR CLIENTS, DEVELOPERS AND END-USERS.

CURRENT **UK STANDARDS**

To compound the issue, current regulations surrounding the control of noise in UK buildings are both vague and insufficient.

Noise (defined as unwanted sound) within a new development can come from many sources including occupants of adjoining rooms or properties, extraction or ventilation units, water or drainage travelling through pipes, running taps and flushing toilets. This is evident within any dwelling, including houses and apartments, as well as rooms used for residential purposes such as hotels, student accommodation and care homes.

There are various acoustically optimised products available to building designers and architects to mitigate the impact of such noise, from plasterboard to pipes. However, there is very little clarification within the current UK regulations on what products should be used to achieve specific sound pressures, particularly in the case of water and sanitary noise.

For example, BSI's British Standard 8233:2014 Guidance for Sound Insulation and Noise Reduction in Buildings simply states that water systems including hot and cold water services and waste pipes "are not to cause disturbance in normal use".

This vague guideline is the document's only reference to reducing sanitary noise in buildings, even though research shows that more than a quarter of homeowners are regularly affected by bathroom noise and 17% blame water, including toilets and pipes (YouGov Survey, 2021).

The same document does offer 'desirable' indoor average noise levels, which vary according to the room. In the bedroom, this guideline is set at 35dB between 7am and 11pm and 30dB between 11pm and 7am. BS 8233:2014 states: "In general, for steady external noise sources, it is desirable that the internal ambient noise level does not exceed the guideline values."

"NOISE EMISSION FROM HYDRAULIC SYSTEMS, INCLUDING DOMESTIC HOT AND COLD WATER SERVICES, REFRIGERANT PIPEWORK, AND SOIL AND WASTE PIPES SERVING OTHER BEDROOMS, **IS NOT TO CAUSE DISTURBANCE IN NORMAL USE."**

SOURCE: BS 8233:2014

NOISE RATINGS

One way for building designers and specifiers to apply a holistic building approach is to use Noise Ratings (NR).

Noise Ratings serve as a standard way to measure and specify noise in buildings and occupied spaces. The single figure rating takes into account the **frequency content of the noise** and is based on an approximate calculation relating to dB(A). This system is often used in the measurement of noise from mechanical sources such as HVAC systems.

Acoustically optimised pipes and fittings such as the Geberit Silent-dB20 range are within the realm of NR and do comply with the maximum recommended NR levels. For example, the maximum recommended NR level for a private dwelling is NR 30, compared with NR 35 in schools and hotels, NR 45 in supermarkets and NR 60 for light engineering works.

You may expect to turn to Building Regulations for clarification, but UK Building Regulations are no more specific overhow building design and product specification should be applied to reduce the noise from water systems.

Building Regulations (2010) Approved Document E 'Resistance to the passage of sound' consists of four parts and largely focuses on measures to control external sound (see table).

It stipulates that any wall or floor should reduce the noise transmitted to the next room by 45dB(A) or more, but fails to set a maximum noise level, nor does it mention the use of any acoustically optimised products.

The only specific guidance offered is that for pipes passing through floor penetration (e.g. bedrooms and living rooms), **wrapping with 25mm of unfaced mineral wool within a plasterboard duct (15 kg/sq.m) is deemed to be adequate.**

In contrast, many other European countries are regulating the acoustic performance of buildings far more closely by taking a full system approach. **As they lead the way in this area, just what can we learn?**

The level of sound insulation depends on various factors in front and behind the wall, which will affect the airborne and solid-borne sound levels and proportions.

In Germany, the DIN 4109 acoustic standard outlines sound insulation in buildings, including requirements and verifications, as well as clear requirements on internal noise in buildings (see table). In doing so it sets maximum limits for acoustics inside a building - the requirement for sanitary noise inside buildings is max. 30dB(A) in terms of LAFmax, n.

However, there is no baseline figure for the sound pressure of water and drainage passing through pipe system in UK properties.

This undoubtedly presents a challenge, putting the onus on designers, specifiers and contractors to provide an adequate solution within the consideration of the overall building design.

ARE YOU ASKING THE RIGHT QUESTIONS TO GAIN THE UNDERSTANDING AND PRODUCT KNOWLEDGE NEEDED TO OVERCOME THIS CHALLENGE?

Considering post-occupancy satisfaction and indeed wellbeing is key. Yet, a RIBA policy report in October 2020 showed that only 19% of UK architectural practices offer Post Occupancy Evaluation. Taking a customer-first approach and challenging inertia and attitudes is critical.

OVERVIEW OF UK AND INTERNATIONAL SOUND INSULATION STANDARDS AND REGULATIONS

UK Building Regulations (2010) Approved Document E	'Resistance to the passage of sound' **E1** → Protection against sound from other parts of the building and adjoining buildings; **E2** → Protection against sound within a dwelling house; **E3** → Reverberation in common internal parts of a residential building; **E4** → Acoustic Conditions in Schools.
BSI's British Standard 8233:2014	Guidance for Sound Insulation and Noise Reduction in Buildings
European Standard EN 14366	Laboratory measurement tool for acoustical characterization of waste water systems
German Standard DIN 4109	Outlines minimum requirements for sound insulation in buildings, together with DIN 4109/A1 Sound insulation in buildings DIN 4109 supplement 2 – sound insulation in buildings (proposals for increased sound insulation)
German Standard VDI 4100	Supplementary to DIN 4109, this outlines increased insulation requirements. Defined as 'Sound Insulation between rooms in buildings – Dwellings – Assessment and proposals for enhanced sound insulation between rooms. It defines four classes of sound insulation for the planning and evaluation of enhanced sound insulation for multi-family buildings, terraced and semi-detached houses.

In practice, we are usually met with European Standard EN 14366 requirements, in the form of sound certification from the Fraunhofer Institute. However, this type of acoustic testing is unreliable, due to the various measured outcomes from the standard configuration. In the past, this type of testing has revealed some fantastic results because manufacturers are, unfortunately, allowed to set up their own conditions at the Fraunhofer Institute, enabling them to make optimisations that are not 'true to life'. Instead, DIN 4109 presents a complete system test including behind and in front of the wall product testing.

Example of EN 14366 standard configuration for sound certification

- → Four floors (inc. basement)
- → Basement is insulated against solid-borne sound
- → 25 cm transition section in basement
- → Two fastenings per floor
- → Wall: 220 kg/m²
- → Measurement in lower ground floor, behind/ in front of wall
- → Laminar flow 0.5, 1.0, 2.0, 4.0 l/s (continuous flow)

Example of DIN 4109 standard configuration for sound certification

- → 2 l/s conveyed through system when flush is actuated => no constant volumetric flow rate
- → Three floors
- → Basement not insulated
- → Potable water: Flow pressure 0.3 MPa, fill time approx. 45 s
- → Installation wall 180 kg/m²
- → Prewall system (insulating effect)
- → Floor: 220 mm thick
- → A structure for the real world

The DIN 4109 approach is based on system measurements. The Fraunhofer Institute testing is merely a document to show how manufacturers are installing – there is no responsibility on project teams to conform to these same standards on site.

Are sound values valid without the detailed documentation to back them up?

WHY IT MATTERS.
THE CHALLENGE

WHY EXACTLY DOES NOISE MATTER?

Firstly, it matters to our health. As we have already said, the World Health Organisation notes that noise pollution contributes to stress and high blood pressure, cardiovascular disease, dementia, diabetes, and of course, hearing loss. One study of aircraft noise around Heathrow Airport found that high levels of aircraft noise was associated with increased risks of hospital admission and death from stroke, coronary heart disease, and cardiovascular disease in the nearby area (BMJ, 2013).

It also matters to our mood and ultimately our wellbeing. Prolonged exposure to noise can create negative feelings such as irritation, dissatisfaction and nuisance, as well as a feeling of having one's privacy invaded. Noisy work and home settings have been proven to annoy people, with evidence of depression and anxiety resulting from noise annoyance (NCBI, 2015). Studies have also linked noise issues in work and school environments to reduced concentration, productivity and performance.

"STILL THERE REMAINS A LACK OF STEWARDSHIP AND SPECIFIC REGULATIONS GOVERNING THE CONTROL OF NOISE INSIDE NEW BUILDINGS"

WHY IT MATTERS – THE CHALLENGE

OF COURSE, THE ISSUE OF NOISE IS NOT COMPLETELY UNRECOGNISED IN PLANNING AND BUILDING DESIGN.

There are clear planning guidelines relating to the acoustic impact of new developments to their environment, particularly for non-commercial developments, for example. Developers and building designers are also increasingly aware of the need to mitigate the impact of external noise such as road, rail and air traffic and aeroplanes. This can be achieved using a number of measures including acoustic plasterboard or acoustic insulation.

Yet despite the fact that installation elements have direct contact with walls and floors, there still remains a lack of stewardship and specific regulations governing the control of wastewater noise inside new buildings. In fact, there is an argument that increased sound insulation has amplified noise within the home, highlighting internal noises that were previously unheard.

One such example of this failure to address acoustic performance is the Living with Beauty report (January 2020) by The Building Better, Building Beautiful Commission. The Commission is an independent body that will advise government on how to promote and increase the use of high-quality design for new build homes and neighbourhoods. But its most recent publication, a 180-page document which proposes a new development and planning framework, makes no reference to noise or acoustic performance whatsoever. It seems noise remains at the bottom of both the environmental and wellbeing agenda.

→ **In a YouGov poll commissioned by Geberit:**

52%

MORE THAN HALF (52%) OF HOMEOWNERS SAY THAT UNWANTED NOISE IN THEIR HOME HAVE A NEGATIVE IMPACT ON THEIR WELLBEING

34%

NOISES INSIDE THE HOME (34%) AFFECT MORE PEOPLE THAN TRAFFIC (26%)

26%

MORE THAN A QUARTER (26%) SAY THEY ARE REGULARLY AFFECTED BY BATHROOM SOUNDS INCLUDING THE TOILET FLUSHING, DRAINAGE AND PIPES

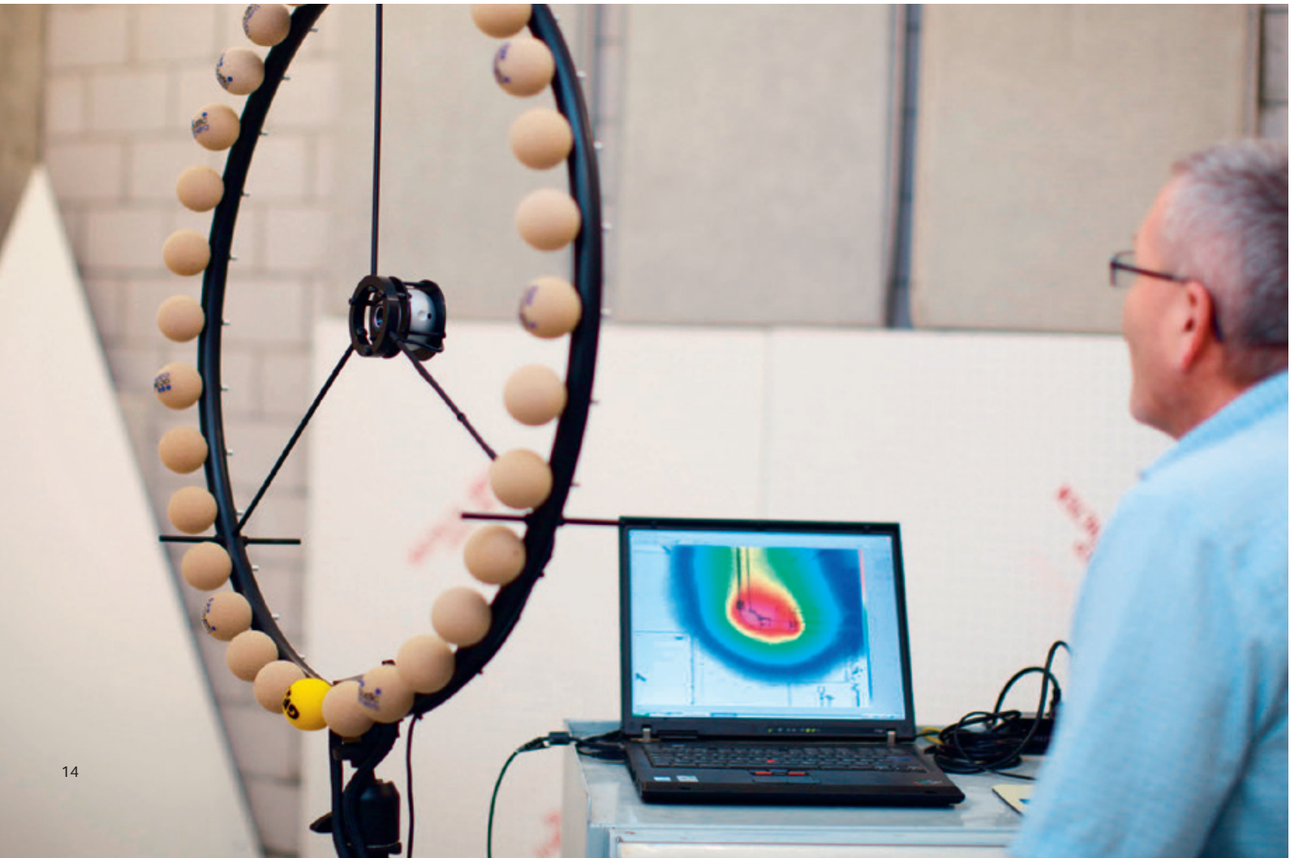
2037 respondents, April 2021

ADDRESSING **THE CHALLENGE**

Designers and specifiers are aware that buildings not only need to be designed to be functional and aesthetically pleasing, but acoustically satisfying as well; whether this is to support wellbeing in the home, encourage productivity in the workplace or to enhance customer satisfaction in a hotel.

However, without strict regulatory requirements or recognised standards for acoustic performance, this can be a challenge. There is risk of thinking in silos, which leads to ill-informed decisions that are not collaboratively tested.

Building designers in the UK must not use this as an excuse for poor acoustics performance. Instead they must use this lack of guidance as a catalyst to seek clarity and make better-informed decisions over building noise.



WHY IT MATTERS. **THE IMPACT**

The need to address the challenge of acoustic performance inside new developments and particularly of wastewater systems is highlighted by the results of a recent poll of 2,037 homeowners by YouGov, commissioned by Geberit (April 2021).

Noise is clearly an issue and particularly in the bathroom. More than a quarter (26%) of respondents say they are regularly affected by bathroom sounds and 19% blame water, which includes toilet flushing, drainage and pipes.

More than half (52%) say that these unwanted noises at home have a negative impact on their wellbeing.

Yet, despite these findings and the clear negative impact of noise, research carried out by Geberit last year also demonstrated that **homeowners were largely oblivious to acoustic performance.** Only 34% of respondents considered the acoustic performance of the property before purchasing, and seven in ten (70%) said they are not aware of any legal requirements or regulations on acoustics in the home.

- → **More than half of homeowners say unwanted noises have negative impact on wellbeing**
- → **Bathroom noises are the most common complaint, including water from toilet flushing, drainage and pipes**
- → **But homeowners are still largely oblivious to acoustic performance**
- → **Most do not consider acoustic performance before purchasing a property**
- → **They are also unaware of acoustic solutions available, such as acoustically optimised drainage**

A WHOLE BUILDING **APPROACH**

The evidence presented so far within this document shows that BS 8233:2014 is not fit for purpose. Clearly the acoustic performance of buildings must be driven by the industry (not the consumer), but current standards offer vague recommendations and little guidance for designers. **Language such as 'in general' and 'desirable' are insufficient.**

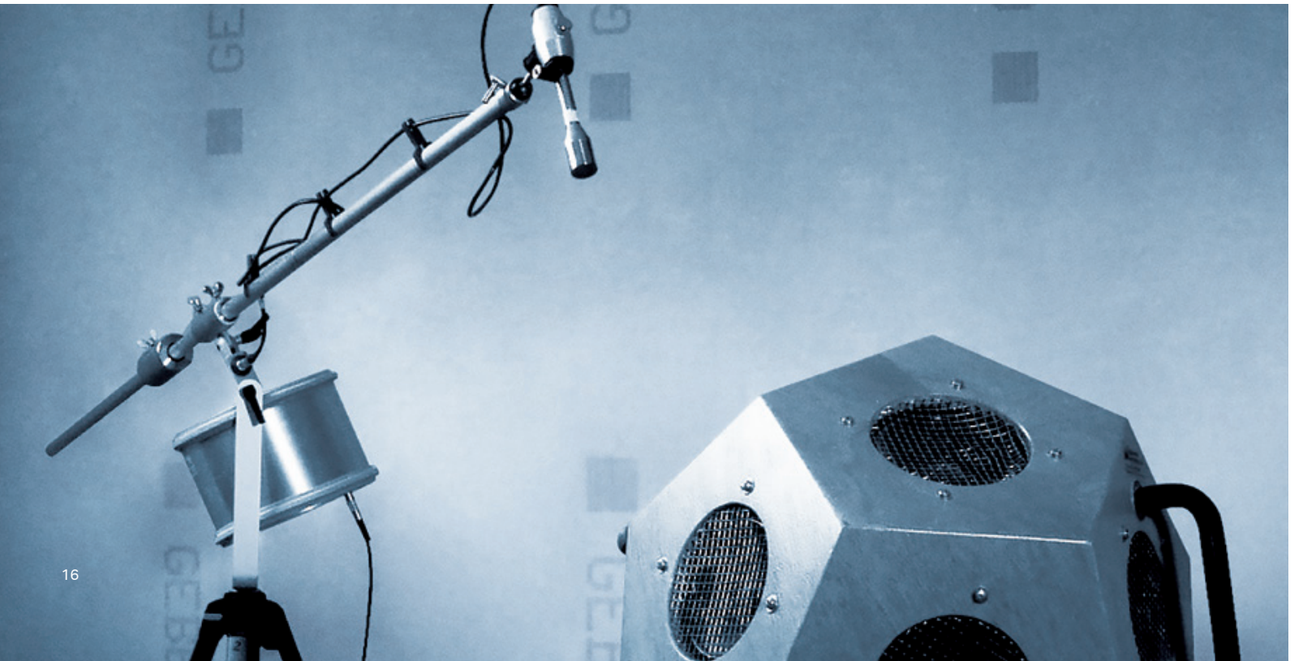
Building Regulations Part E offers vague guidance for drainage, but falls short of setting minimum standards on noise levels to work to and offers no mention of acoustically optimised products. Without specific UK standards on the noise pressure from water systems inside new buildings, there is no requirement to meet a baseline figure and no requirement to improve.

However, we believe this should not give building designers and specifiers licence to under-consider acoustic performance of drainage systems.

We have shown the impact of noise on occupier wellbeing and this includes noise from drainage and other services, in addition to mechanical systems such as HVAC. In doing so, we have also identified the opportunities presented by acoustically optimised buildings.

Armed with this insight, the onus must now be on building designers to take a holistic system approach to building noise, working with specification partners to design effective systems throughout the property.

And, at the heart of this, lies product choice. Acoustically optimised pipework (inherently using more dense materials), when combined with rubber and plastics where possible for decoupling and dampening, will not transmit sound as well as less dense materials. When considered alongside effective building insulation, low-noise mechanical climate systems and other acoustic performance measures, it provides a whole-building solution which addresses the needs of occupiers and adds value for developers.



DRIVING CHANGE **THE SOLUTIONS**

To reduce sanitary noise, we must think about the source, path and receiver. There are a number of ways to achieve better sound insulation through sanitary technology, either at the source, path and/or receiver.

In addition, it is important to design a building with acoustics in mind from the outset and this requires consideration of the different room types. There are critical rooms, such as living rooms and bedrooms, and uncritical rooms such as bathrooms and kitchens. It is best practice to try and build the same type of rooms on top of each and next to each other, meaning any noise transfer from the uncritical rooms will not be an annoyance in the critical rooms. Where this cannot be avoided, it is important to ensure additional acoustic insulation is installed to reduce the effect on the critical rooms.

With this approach in mind, and by following a few fundamental principles detailed below, architects and consultants can reduce
the impact of noise from toilet flushing, drainage and pipes, delivering a better experience for the end user.

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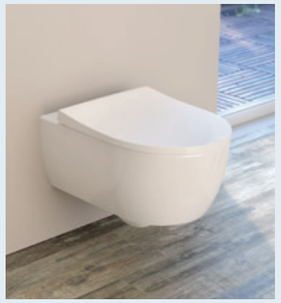
Example of acoustically optimised bathroom

SOUND INSULATION IN **SANITARY TECHNOLOGY**

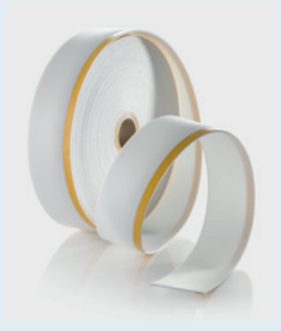


Wall-hung WC

When choosing a WC always look to wall mount to decouple from the floor.

Optimised wall-hung frame

By designing in a Geberit Duofix frame you have already optimised your acoustic values. Integrated rubber tipped push rods to reduce noise from the flush plate when pressed for flushing, a polythene jacket insulating the cistern, circlips on threaded rods to eliminate movement and sound absorbing seals on drainage brackets - Geberit Duofix frames have it covered.



Insulation tape

Duofix insulation tape for structure-bourne sound minimisation between panels, system rails and building structures.

Sound insulation pad

When installing a WC, always use a sound insulation mat as well as sound insulation sleeves for the fastening screws.

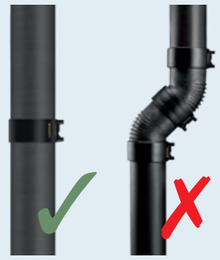
SOUND MEASUREMENTS AT GEBERIT

As a progressive manufacturer, Geberit products adhere to the standards outlined in DIN 4109. Geberit has performed sound measurements under realistic conditions in a laboratory set up specifically for this purpose. These have produced reliable measurement results for specifiers, users and designers.
The measurement results can be found on the page that follow. Please note that the specified sound pressure levels apply to the construction situations mentioned in each case and may only be of limited relevance to other construction situations.

Pipe bracket with sound insulation

Always choose pipe brackets with a rubber lining and make sure they are not tightened too firmly. Never use cement for fastening components to the wall, as this could result in sound bridges.

By selecting Geberit pipe brackets with the appropriate diameter and tightening them fully, it is possible to achieve optimum fastening and sound insulation conditions.



Stack without direction change

Where possible, do not incorporate direction changes into stacks. Straight stacks have a lower effect on acoustic insulation.

If direction changes are unavoidable, however, take care to ensure that the angles of the resulting diversions are as small as possible.

Quiet pipes

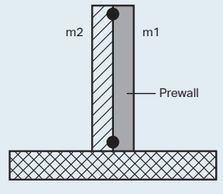
Geberit Silent-db20 is highly sound optimised with mineral reinforced polyethylene for a denser material and fittings to dissipate noise at impact zones. In addition, Geberit Silent-PP has mineral-reinforced three layer construction to ensure reduced sound from waste water. Geberit Silent-PP and Geberit Silent-db20 offer acoustic value to a wide range of applications.

Insulation mats

Wraps pipes and fittings to reduce airborne sound spreading.

Jointing method

Electrofusion couplings maintain a smooth internal bore thus reducing noise transfer.



Prewall protection

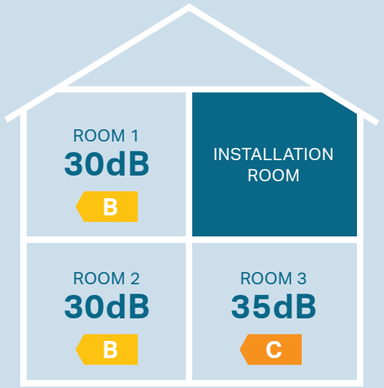
The larger the ratio in mass per unit area between the prewall (m1) and the wall (m2), the better the joint insulation will be.

UK **SOUND MEASUREMENTS**

All test installations were designed in the UK and the measurements conducted by Geberit in their own sound laboratories. By installing the complete Geberit system we are able to take test measurements from real UK scenarios and measure the results from three different adjoining rooms. The acoustics from a bathroom are not solely dependent on the drainage pipe, and as such testing the complete system inclusive of cistern, WC, wall structure and drainage is far more meaningful in the real world.

SOUND MEASUREMENT TESTING RESULTS

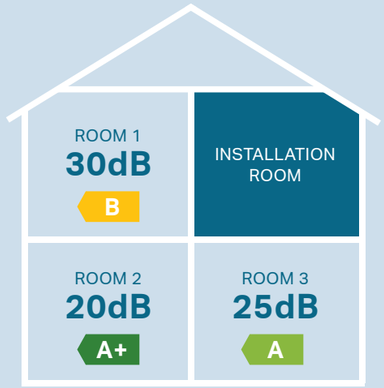
→ TEST 1



INSTALLATION ROOM CONDITIONS

- → Timber stud walls
- → 15mm plasterboard
- → Floor standing back to wall WC
- → Silent-db20

→ TEST 2



INSTALLATION ROOM CONDITIONS

- → Duofix metal stud walls
- → 18mm plasterboard
- → Wall-hung WC
- → Silent-db20

WHY **GEBERIT?**

A BRAND SYNONYMOUS WITH QUALITY AND DURABILITY, GEBERIT'S PORTFOLIO COVERS A WIDE RANGE OF BEHIND THE WALL AND IN FRONT OF THE WALL SANITARY SOLUTIONS.

For generations it has provided the building industry with the products and systems needed to meet project challenges and deliver complete bathroom solutions. With a focus on innovation and reliability, its systems cover every water path in commercial and non-commercial buildings, from the water supply and building-wide distribution, to drainage systems from rooftops and high-rise buildings. Geberit also offers a choice of frames, flush plates and ceramics, providing an entire bathroom or washroom package for any application.

Crucially, Geberit never stands still. In fact, it is a pioneer for innovation, leading the way for research and development across all areas of sanitary technology.

ACOUSTICS EXPERTISE

Acoustics is one of Geberit's ten core research areas, developed to ensure the quality and effectiveness of its research and development.

By combining cutting-edge technologies with comprehensive know-how and a strong focus on innovation, Geberit is committed to sustainably increasing quality of life. Always searching for new technologies and materials in order to improve products and processes, it brings global technical expertise, unrivalled testing capabilities and a wealth of experience in all development sectors.

For acoustics specifically, this includes locating and remedying the cause of sanitary noises to reduce disruption, whilst working with the industry to support more effective acoustic design. The long-term objective is to ensure that sanitary noises become a thing of the past.

At the heart of this is Geberit's unique building technology and acoustics laboratory - a four-storey building where virtually any construction situation can be acoustically recorded using state-of-the-art measurement technology. This truly global leading facility enables best-in-class experts to research products, technologies and also the impact that various installation techniques have on sound emissions, ensuring more effective solutions for all.

WANT TO
KNOW MORE?

Take our CIBSE and RIBA approved CPD session, ‘ The importance of embedding acoustics into design’, to better understand the causes of noise and the importance of considering the acoustic impact on a building space as well as the current regulations.

BOOK NOW: VISIT **GEBERIT.CO.UK/CPD**

HERE TO SUPPORT YOUR NEXT PROJECT

At Geberit our team of specification experts are on-hand to support your next project. From overcoming challenging design concepts to providing hands-on training - we have a wealth of product and sector knowledge to help make your life easier.

- → CIBSE and RIBA approved training
- → Take-offs and estimations
- → Technical advice
- → Product insight

GET IN TOUCH WITH THE TEAM
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