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Quality Assurance
Quality Management Systems
BS EN ISO 9001:2015
(Registered firm: 12908)

Environmental Standard
Environmental Management Systems
BS EN ISO 14001:2004

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CAST IRON
ACOUSTIC
DRAINAGE

THE SOUND OF WELLBEING

MAKING NOISE A PRIORITY



Ensign



EEZI-FIT





30dB

The desired level required for soil pipes adjacent to habitable rooms for quality flats and apartments.

+10dB

Ensign pipes offer this level of acoustic insulation over HDPE systems.

2l/s

The equivalent flow rate of one toilet flush.

8l/s

The flow rate to which PAM has tested its cast iron systems.

How can cast iron drainage enhance quality of life?

The secret to wellbeing is giving people the peace and quiet to enjoy their spaces. And cast iron acoustic drainage offers a superior solution to help all of us live life better.

Our cities are shaped by wellbeing. It's core to sustainable building, a key value driver, and crucial for desirable, high-end living spaces. With many of these spaces occupying high-rise, high-occupancy apartment buildings, acoustics is a vital factor in this, providing calm surroundings for relaxation and comfort. Everything must be considered: noise from the street, noise from neighbours, and noise from building services and operations - like drainage systems.

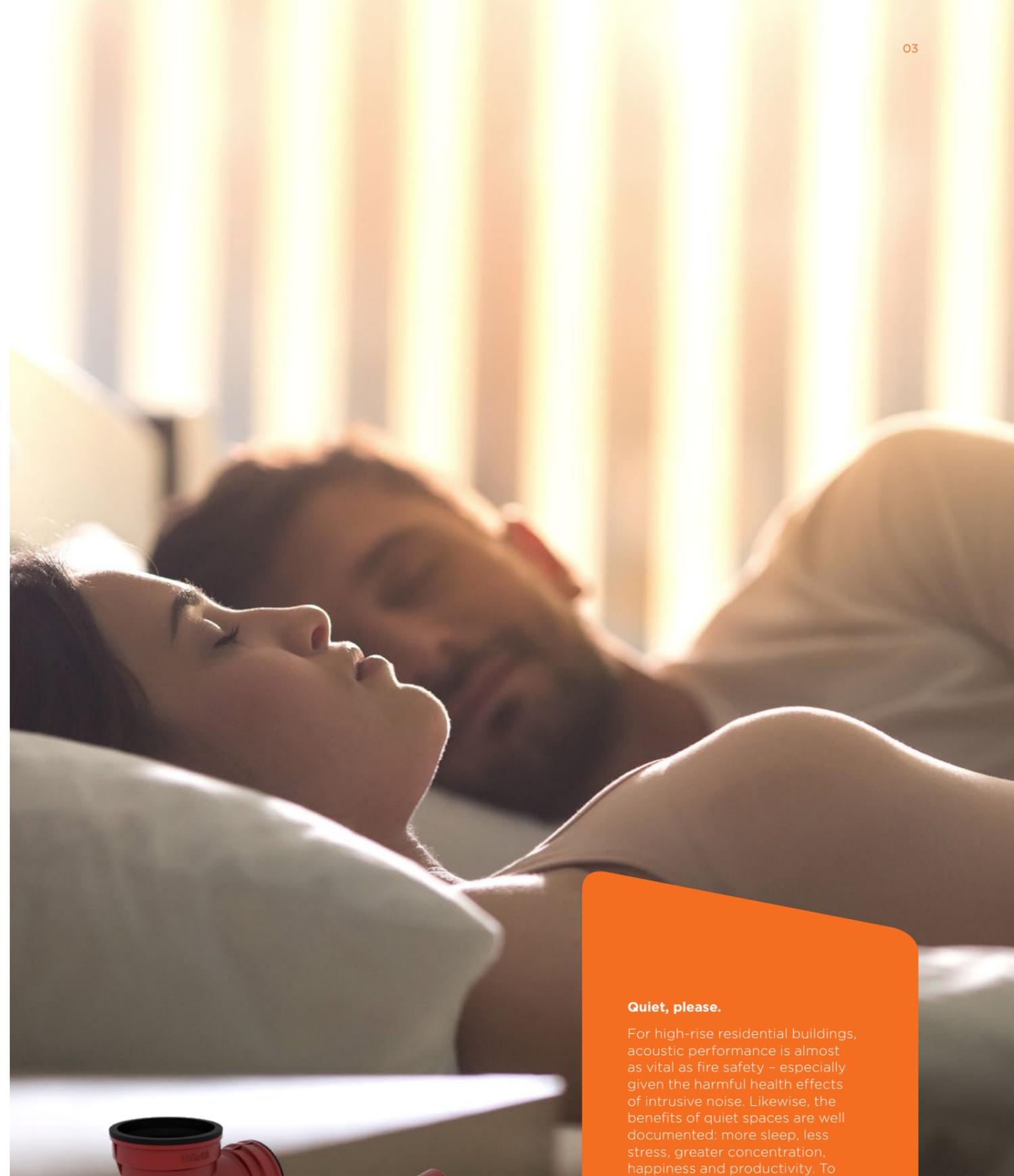
Making noise a priority.

Concerning clients and specifiers of high-rise residential buildings, acoustic performance is now second only to fire safety. In drainage pipework, sound emerges from water and air turbulence, particularly the effect of flow on pipe walls, and emanates through the pipe and structure via the brackets. This adds to unwanted noise within a building - and, especially in premium apartment complexes, when the need for quiet is essential, we need to make noise a priority.

Outstanding acoustic properties.

Saint-Gobain PAM in making noise a priority have gone further with laboratory testing, measuring its systems to flowrates of up to 8 l/s which can easily occur in multi-storey buildings and in pipework up to 150mm diameter. Compare this to other materials which offer limited test data and mostly show results at 2 l/s which is the equivalent of only one toilet flush.

Ensign cast iron drainage offers superior airborne acoustic performance of at least 10dB over other materials such as standard HDPE and PVC. Backed by independent testing, cast iron still leaves acoustic plastic systems trailing, with its greater material density that delivers natural acoustic performance capable of achieving 30dB boxed in - without the need for additional pipe wrap insulation.



Quiet, please.

For high-rise residential buildings, acoustic performance is almost as vital as fire safety - especially given the harmful health effects of intrusive noise. Likewise, the benefits of quiet spaces are well documented: more sleep, less stress, greater concentration, happiness and productivity. To safeguard wellbeing, buildings need to absorb and attenuate noise - and every part of them needs to play its role. Saint-Gobain PAM's cast iron acoustic drainage solutions are designed to do this while enhancing value and upholding the standards with which you build.



The real value of cast iron acoustic drainage.

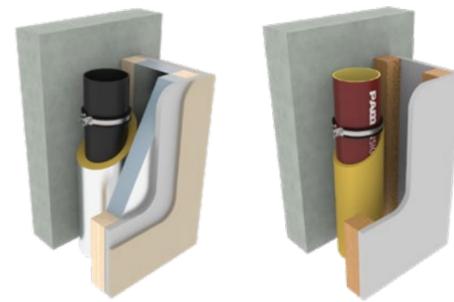
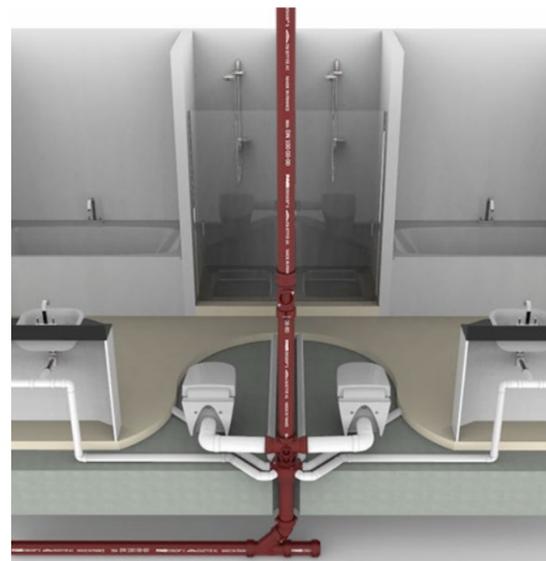
With a host of conflicting information comparing acoustic levels of pipe materials and, ultimately, the true installation costs of these solutions, let us give you some clarity...

Today's realities. Tomorrow's possibilities.

The building regulations Doc E and the NHBC guidelines have been in place for many years – long before the introduction of BS EN 14366:2004, which provides laboratory-measured performance levels for pipe systems. Without such information being available, the industry settled on a 'one solution fits all' guideline to maintain some form of consistent installation standard.

The high level of acoustic performance specified is to keep external inner-city noise out – but this can exacerbate internal acoustic issues, making noise generated from pipe services even more sensitive.

However, while there is a growing need to improve acoustic comfort in our living spaces, pressures are greater than ever to keep building costs to a minimum. All too often in the name of value engineering, high-performing pipe materials are switched to lower-priced systems without calculating the real cost needed in order to deliver similar performance to original specifications.



Cast iron can perform without insulation

Sample Installation Costs

	Installed cost of insulation per m £	
	25mm Unfaced Mineral Wool Circa £15 per M	Special Acoustic eg. Muftilag Circa £45 per M
Cast Iron	✓	Not needed
HDPE	-	✓

Drainage: Comparable testing.

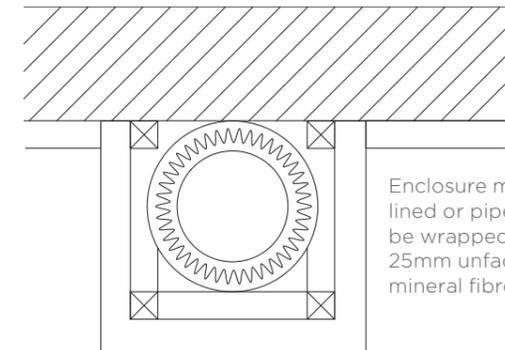
BS EN 14366:2004 was developed by a European technical committee representing all materials. Standard test criteria were formulated to provide comparable performance data, to help specifiers make a more informed choice as to what level of insulation is required for each material to achieve a particular acoustic level.

However, manufacturers can be selective in the messages and results they communicate, often causing comparisons to be made at differing flow rates. Some manufacturers have branded their systems around dB levels which can mislead designers into making specification decisions without all the facts. Saint-Gobain PAM know that product compliance does not necessarily equal product performance.

Sound insulation of pipes

Noise levels generated from pipes now available (BS EN 14366:2004) – cast iron is the only material that demonstrates performance without the need for lagging.

NHBC guidelines: standard product compliance



Enclosure must be lined or pipe must be wrapped with 25mm unfaced mineral fibre.

The materials of the enclosure should have a mass of 15kg/m²

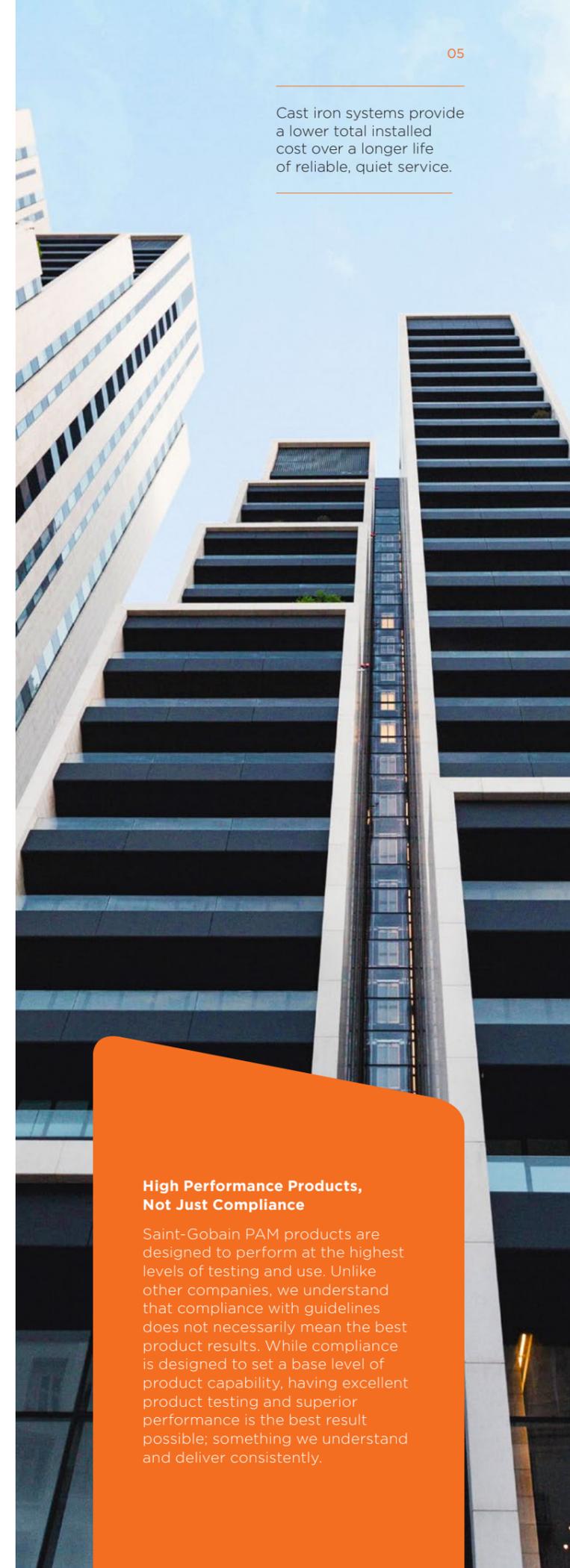
Cast Iron: Delivering high performance as standard.

- Higher acoustic performance without the need for 25mm of pipe lagging (Based on enclosure meeting guidelines)
- Higher fire resistance – fire rated A1 and requires no fire protection
- Longer lifespan – replacement not required after 30 years

Service Life Expectation:

- Sanitary soil and internal rainwater systems - 70 years

Cast iron systems provide a lower total installed cost over a longer life of reliable, quiet service.



High Performance Products, Not Just Compliance

Saint-Gobain PAM products are designed to perform at the highest levels of testing and use. Unlike other companies, we understand that compliance with guidelines does not necessarily mean the best product results. While compliance is designed to set a base level of product capability, having excellent product testing and superior performance is the best result possible; something we understand and deliver consistently.

Acoustic performance where you need it most.

Saint-Gobain PAM has gone further with acoustic testing to demonstrate its superior performance – as confirmed by an independent report from acoustic consultants.

The most critical areas in the drainage network to manage acoustic performance are:

- Where pipework needs to offset to avoid structural elements.
- Where pipework bends from vertical to horizontal.

While the recommendation is to always avoid offsets, this is often not possible. In such cases, the typical approach is to significantly wrap the pipe, whichever material it is.

Testing information from manufacturers in this scenario has been little publicised – if at all. This leaves specifiers with a vacuum of comparable data in which to make informed decisions.

New Saint-Gobain PAM tests at CSTB Laboratory.

Saint-Gobain PAM tested both of our cast iron drainage systems (Ensign and EEZI-FIT) for above-ground applications, comparing them to competitor materials including standard HDPE and DB20.

The tests focused on measuring airborne noise transmitted at the point when the pipe offsets. Then, using industry-recognised software, levels of acoustic insulation were applied to simulate what overall performance would be achieved – and, more importantly, if, and at what level, the system can achieve the 30dB desired for habitable rooms.

TVVL Holland study.

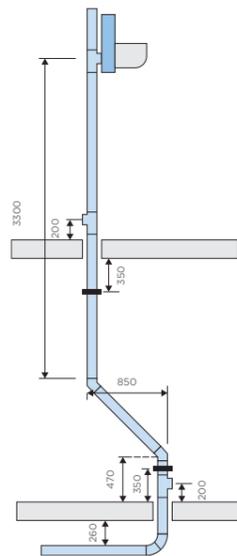
An independent study was carried out by acoustic consultants TVVL in a similar offset set-up criteria, comparing a number of drainage materials including Saint-Gobain PAM cast iron to EN877 and DB20 acoustic HDPE. Cast iron secured the best acoustic performance by far, with an airborne superiority of 8dB under a higher flow rate of 3l/s.

Pioneering independent testing.

Saint-Gobain PAM was one of the world's first manufacturers to test to BS EN 14366:2004. To prove the enduring acoustic quality of cast iron drainage, our latest laboratory testing has focused on where the sources of noise are the most critical in the system. By adding the insulation levels through simulation, it provides the designer with more clarity around performance expectation from various materials.

What has become clear from the testing is that reliance on NHBC 'one criteria-fits all' guidelines should be challenged and is no guarantee of 30dB for all materials.

Offset testing scenario



Test Results - CSTB

Testing laboratory pipe systems installed in 'offset' situation

Flow rate tested = 2 l/s

		A	B	C	D
		Airbourne Noise db(A) Lan Δ	Insulation Level 19 db(A) Lan Δ	Insulation Level 25 db(A) Lan Δ	Insulation Level 34 db(A) Lan Δ
Brackets	System	LAS, max (50-5000 Hz) dB	LAS, max (50-5000 Hz) dB	LAS, max (50-5000 Hz) dB	LAS, max (50-5000 Hz) dB
Rubber-lined	Ensign / EEZI-FIT	50	33	30	28
Iron bracket + dampener	Ensign / EEZI-FIT	51	32	25	17
Rubber-lined	HDPE	64	47	43	41
Rubber-lined	DB20	60	41	36	33

■ 30-35db Habitable room requirement
■ ≤ 30-35db Habitable room requirement

A Bare Pipes
B Boxed in x 2 layers of board
C Equivalent to Doc E / NHBC guidelines
D Equivalent to 2 x layers of board + Acoustic Insulation



Specify and install PAM cast iron with confidence of FULL compliance.

Our acoustic drainage systems have been tested at independent accredited laboratories to BS EN 14366:2004 criteria. The results demonstrate significant superior acoustic performance over HDPE and acoustic HDPE, also experienced by TVVL.

Cast iron is sound thinking for safeguarding wellbeing. Contact your local PAM technical representative today.