



biamp.

SOUND MASKING 101

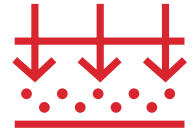
What is sound masking?

SOUND MASKING IS A CRITICAL COMPONENT OF ACOUSTIC DESIGN

When designing an optimal acoustic environment, architects consider a variety of elements to address noise control and speech privacy. Elements added either absorb, block, or cover sound, and are collectively called the ABC's of acoustic design.

All of the ABC's of acoustic design can be used together or individually to achieve the desired acoustic environment, but absorbing and blocking materials are costly and underused. Sound masking, on the other hand, is a low-cost option for creating acoustical environments that both reduce noise distractions and increase speech privacy.

ABSORB: Acoustic wall panels, carpet, and ceiling tiles help absorb excess sound



BLOCK: Solid barriers, partitions, and walls help block excess sound



COVER: Sound masking helps cover distant conversations



Why do you need sound masking?

OPEN FLOOR PLANS

Most workplaces today feature more open spaces and smaller, and often shared, workstations. Fewer sound blocking and absorptive materials are being used such as lower or non-existent partitions, hard or glass surfaces, and thinner walls and doors. This creates acoustical challenges that negatively impact workplace satisfaction, productivity, and speech privacy.

WHY SHOULD I CARE ABOUT POOR ACOUSTICS?



Noise distractions are driving your employees crazy (that's why they are wearing headphones)



The constant interruptions are making your employees less productive and costing you money



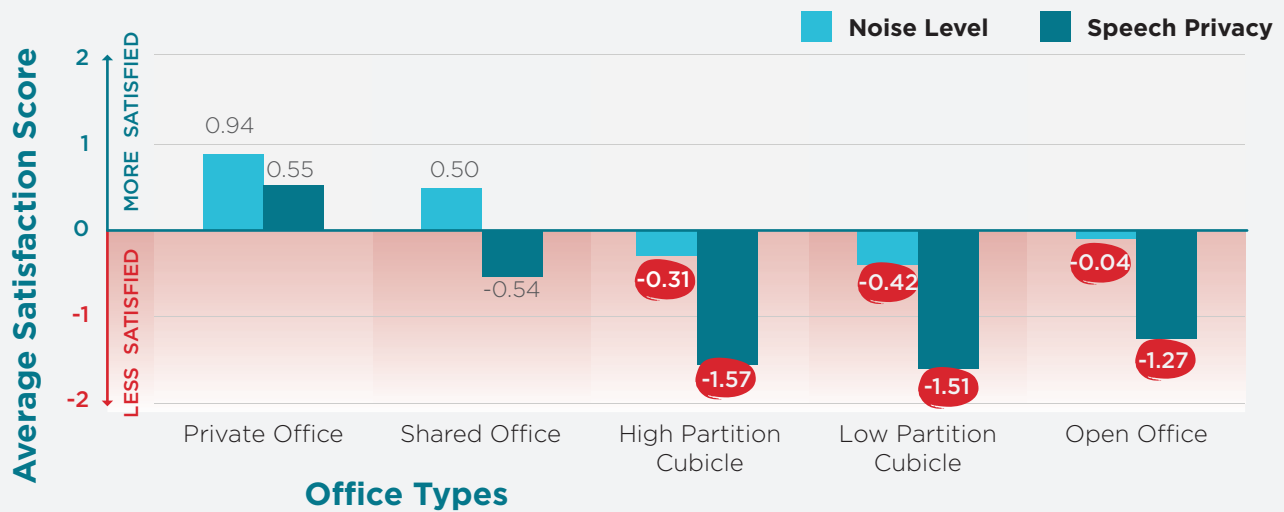
Sensitive data is being communicated and overheard in your work environment, and you are legally bound to protect it

SOUND MASKING INCREASES WORKER SATISFACTION

Approximately 24,000 office workers in private offices, shared offices, cubicles, and open offices were asked to rate their satisfaction with their noise and speech privacy levels. Those with private offices were the only ones satisfied with their speech privacy, and even they only rated them a .55 out of 2 on average.



ARE YOU SATISFIED WITH YOUR OFFICE'S ACOUSTICS?



Source: U.S. General Services Administration Study

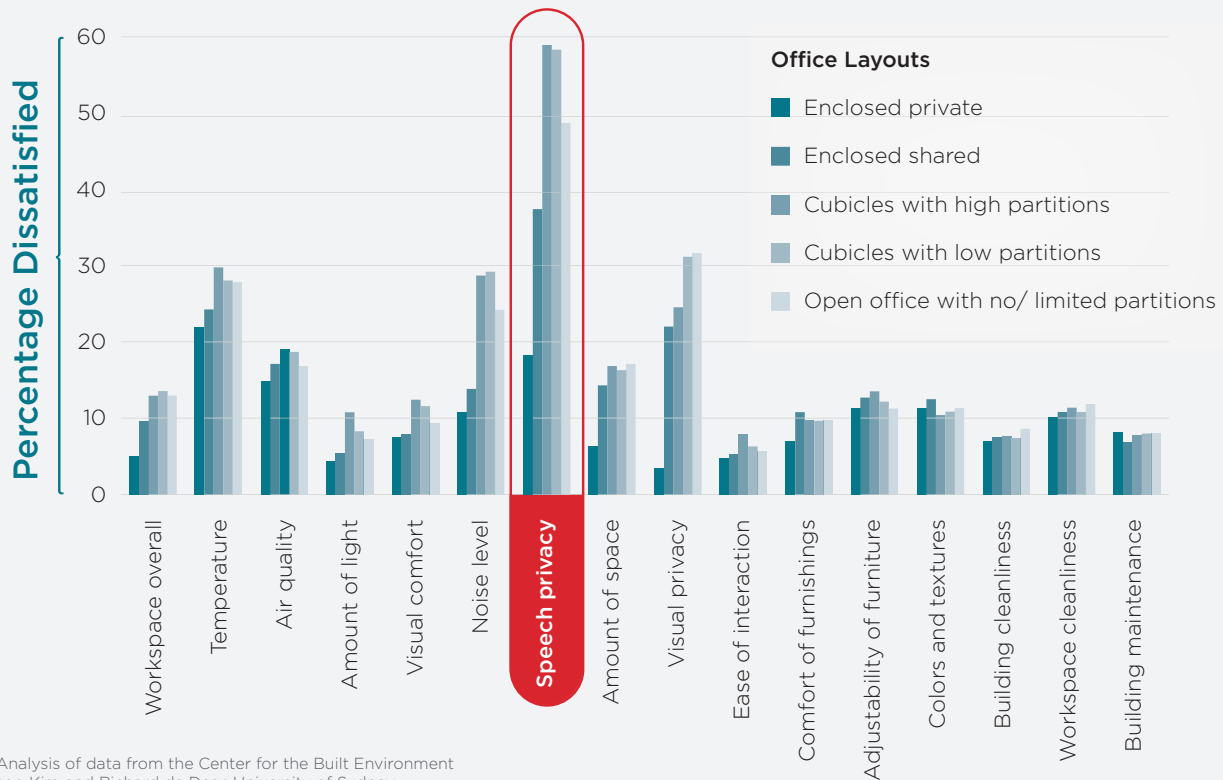
LACK OF SPEECH PRIVACY IS THE #1 CONCERN OF EMPLOYEES

What is speech privacy? Simply put, it's the inability of an unintended listener to understand outside conversations.

The Center for the Built Environment in Berkeley, California, surveyed more than 25,000 workers in more than 2,000 buildings to determine what the key environmental issues were for workers.

Of all of the factors workers encountered in their environment, speech privacy was far and away the factor they were the most dissatisfied with.

DRIVERS OF OFFICE WORKER DISSATISFACTION



DISTRACTIONS MAKE YOUR EMPLOYEES LESS PRODUCTIVE

Employees are interrupted once every 11 minutes according to research from UC Irvine, and it takes them up to 23 minutes to get back into the flow of what they were doing before they were interrupted.

THESE DISTRACTIONS COST MONEY

In a recent study presented to the International Congress of Noise as a Public Health Problem,

researchers found that, on average, employees wasted 21.5 minutes per day due to conversational distractions, making lack of speech privacy the number one cause of reduced productivity. An additional 2014 Steelcase/Ipsos study found that employees lost as much as 86 minutes per day due to noise distractions.

Even using conservative estimates, this loss of productivity adds up to big monetary losses for companies. 21.5 minutes daily is roughly 4% of an average employee's work day (based on an 8 hour day). Some quick math shows that a company with 100 employees and an average employee salary cost of \$50,000 is losing \$200,000 a year in lost productivity.

$$\begin{array}{ccccccc}
 \$200K & = & 100 & \times & 50K & \times & 4\% \\
 & & \text{EMPLOYEES} & & \text{(AVERAGE SALARY COST)} & &
 \end{array}$$

SOUND MASKING HELPS YOUR EMPLOYEES CONCENTRATE AND WORK MORE EFFICIENTLY

Researchers examined the effect of speech privacy on task performance in an open office environment without sound masking and with sound masking. Participants in offices with sound masking had better short-term memory recall than those without it.

INCREASE OF WORD AND NUMBER RECOLLECTION WITH SOUND MASKING

+7.8%
WORD
RECOLLECTION

+8.7%
NUMBER
RECOLLECTION

SOUND MASKING PROTECTS CONFIDENTIALITY AND REDUCES LIABILITY

- Closing the door to an office no longer guarantees speech privacy; in fact, it's probably worse because closing that door provides the illusion of privacy.
- Many private conversations could be HR nightmares if overheard by the wrong people.
- Providing speech privacy is often encouraged, or outright mandated, by the legal and regulatory environment:



HIPAA - Mandates that all employers (not just hospitals) "take reasonable safeguards to protect the privacy of protected health information."



GLBA - In many ways, the Gramm-Leach-Bliley Act (GLBA) is the HIPAA equivalent for the finance industry. GLBA requires financial institutions to protect their client's non-public financial information.



Hospital Consumer Assessment of
Healthcare Providers and Systems

HCAHPS - In the healthcare industry, the Hospital Consumer Assessment of Healthcare Providers and Systems Survey (HCAHPS) provides scores to hospitals based on a variety of criteria, including "quietness of patient environment." Hospitals with low HCAHPS scores risk loss of government funding and damaged reputation.



FERPA - In the education industry, the Family Educational Rights and Privacy Act (FERPA) mandates that colleges and universities take all reasonable efforts to safeguard student information, including how the information is collected and disseminated.

Who benefits from sound masking?

Business Owners

Protect speech privacy and increase productivity by reducing noise distractions

Facility Managers

Help increase worker satisfaction and reduce operating costs

Property Managers

Increase the value of your space

HR Managers and Privacy and Compliance Managers

Comply with the speech privacy requirements of HIPAA and GLBA regulations

Healthcare Managers

Increase HCAHPS scores and HIPAA compliance

Employees

A more comfortable work environment with fewer distractions

Architects

Improve the acoustical environment of new or retrofitted spaces

General Consultants

Create a collaborative work environment without sacrificing acoustics

Contractors

Improve speech privacy and lessen the level of distraction without adding further absorptive and blocking materials

Where should sound masking be used?

Corporate

Open Office, Private Office, Outside of Conference Rooms

Technology

Engineering and Research Labs, Co-share Spaces, Huddle Rooms

Education

Libraries, Classrooms, Testing Centers

Hospitality

Hotel Rooms, Reception Areas, Spas

Healthcare

Hospitals and Clinics, Offices and Counseling Areas, Pharmacies

Financial Services

Retail Banks, Call Centers, Board Rooms

Government & Law

Secured Facilities, Courtrooms, Law Offices

Venues

Airport Lounges, Houses of Worship (Back Office), Conference Centers

How does sound masking work?

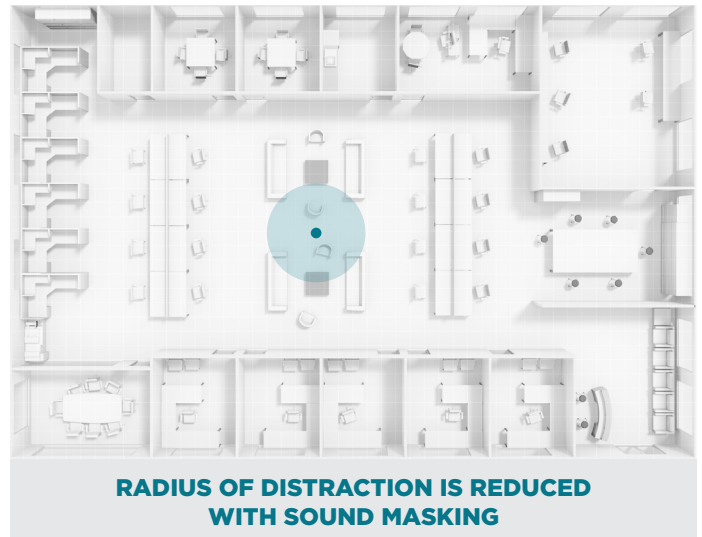
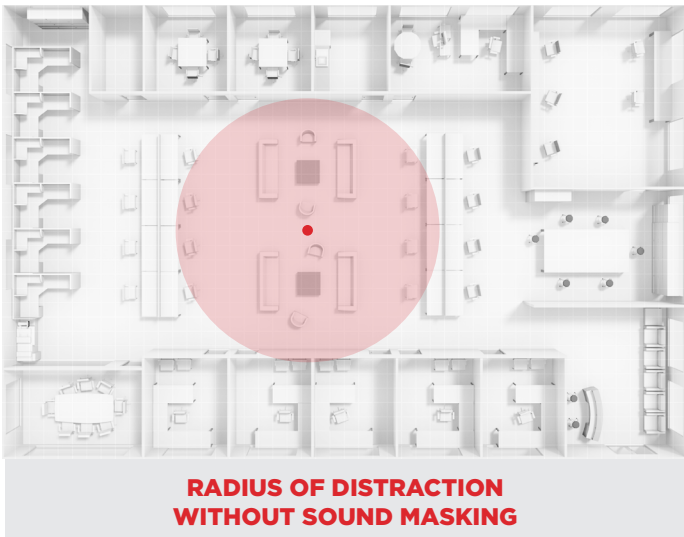
ADDING SOUND MAKES SPEECH LESS INTELLIGIBLE

Adding sound to a space actually makes the space seem quieter. It sounds counter-intuitive, but it's true. This is because the added sound reduces the intelligibility of speech. When you can't understand what someone is saying, their words are less distracting — in fact, you probably don't even notice them.

Have you ever had a conversation while washing dishes? When the water isn't running, you can hear the other person's words perfectly. When you turn the water on it becomes much harder to hear them and understand what they are saying.

The person isn't speaking more softly, but they sound as if they are. This is because the noise of the running water is "masking" the sound of the person speaking to you.

Sound masking mimics this phenomenon on a much more sophisticated and effective scale. By adding ambient sound to an environment (such as professionally engineered sounds similar to water flowing or airflow) you help mask the other noises in the environment, making them less distracting. Sound masking doesn't eliminate all noises in an environment; it simply reduces the area where human speech is intelligible and distracting. We call this area the radius of distraction.



Once masking is added, it becomes more challenging to understand conversations from across the room, and thus makes it less likely that conversations will distract you.

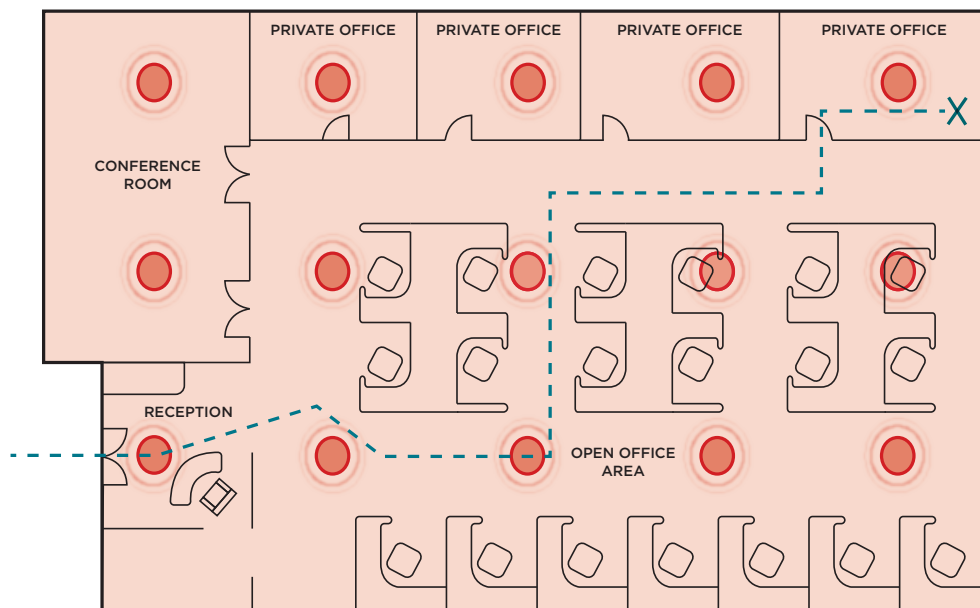
Key Element: Uniformity

SOUND MASKING SHOULD BE UNWAVERING, CONSTANT AND UNCHANGING

A critical factor when planning a sound masking system is ensuring that the output is as uniform as possible. The more uniform a sound is, the easier it is for occupants to tune it out. Any hot spots, dead spots, or other changes to the output increase the likelihood of the occupants noticing it.

For that reason, we often install sound masking in spaces where we are not necessarily concerned with speech privacy, such as hallways, reception areas, lobbies, and transitional areas.

At times sound masking system designs under-specify the number of loudspeakers needed to achieve a uniform masking system. And while fewer loudspeakers means a lower cost, it also means poor sound masking performance. That's because without the proper number of speakers there's little to no uniformity, which results in a sound masking system that's noticeable - thereby becoming a distraction - which totally defeats the purpose of sound masking.



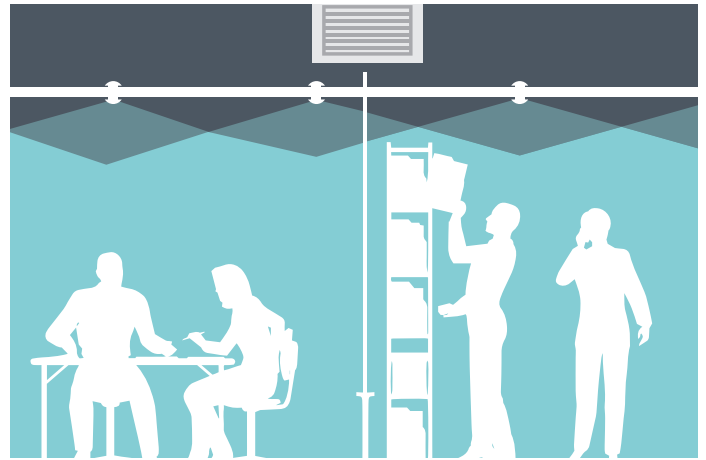
As shown above, sound masking loudspeakers should effectively cover 100 percent of the area so that occupants can move throughout the environment without noticing variations in output level.

Different approaches to sound masking

DIRECT SOUND MASKING

Direct (commonly called direct-field) sound masking uses small loudspeakers installed throughout the ceiling. The loudspeakers, which are also called emitters, broadcast the sound masking signal directly into the office environment.

The major advantage of direct-field sound masking is that it can be completely confined to the areas where it is required, and independent spaces, or zones, can more precisely receive the desired sound masking level.



Direct-field sound masking uses small loudspeakers (emitters) to broadcast the sound masking output directly into the desired coverage area.

INDIRECT SOUND MASKING

Another method of implementing sound masking is through what's called indirect technology.

With indirect sound masking, upward firing loudspeakers are placed below the ceiling deck in what's known as the plenum space.

The sound masking signal is broadcast against the ceiling deck and then reflects downward (often through ceiling tiles) and into the office environment.

The major advantage of indirect sound masking is the ability to individually tune the loudspeakers according to the plenum space's variables, like HVAC ductwork or extensive cabling infrastructure or other acoustics-altering factors.



Indirect sound masking uses upward-firing loudspeakers to broadcast the sound masking output against the ceiling deck, where it reflects downward into the desired environment.

Introducing Biamp's Cambridge Qt X Sound Masking Solution

The Cambridge Qt X series from Biamp offers both direct-field and in-plenum functionality to address the full spectrum of sound masking needs, with Qt X controllers available in 3-zone, 6-zone, and 8-zone models.

Designed to smoothly integrate with Biamp's existing AV and Voice Communication solutions to better enable unified

programming, deployment, and management applications, the Qt X series also offers seamless compatibility with convenience paging stations and background music sources.

And the Qt X series uses Biamp's industry-leading Qt emitters and Dynasound loudspeakers (shown below).

STANDARD QT® EMITTER



QT® ACTIVE EMITTER



DS1339 70.7 VOLT LOUDSPEAKER



DS1357 LOUDSPEAKER FOR 8 OHM SYSTEMS



DS1398 IN-FLOOR / SHALLOW PLENUM LOUDSPEAKER





Sound Masking Technology

ADVANTAGES OF WORKING WITH BIAMP

- The world's largest provider of sound masking solutions with the most extensive network of worldwide certified installers and field engineers
- The most effective sound masking systems available
- The most installer-friendly sound masking solutions available
- Unmatched customer and partner support
- Lowest impact installation and perfect for both new construction and retrofits
- Completely scalable solutions suitable for any size space
- Office paging, background music, and sound masking capabilities all from a single loudspeaker
- Network capabilities for easy control, customization, and system integration
- An affordable alternative to expensive construction projects or sound blocking materials
- Offering products that are GreenSpec listed and the most energy efficient sound masking systems available
- Helps contribute to LEED Certifications
- Customized eavesdropping and SCIF protection services
- Deployed in hundreds of millions of square feet and trusted by over half of the Fortune 100

How Do I Get Sound Masking?

Design, quotation, and installation of Cambridge sound masking systems from Biamp is handled by our staff and our international network of certified sound masking professionals.

Certified sound masking professionals include service providers your business may have already used before, such as:

- Data, voice, and video cabling
- Audiovisual integrators
- Telecom integrators
- Audiovisual consultants
- Low-voltage cabling
- Security integrators
- Office furniture dealers
- Architects and designers

With Cambridge sound masking ... there is less distraction from unwanted sounds and conversations. Patients and staff can now experience the positive ambiance we wanted to achieve ... and we gained a greater level of patient satisfaction.

ALISON BRISSON
Plant Operations Manager
Wentworth Douglas Hospital

The employees were being distracted by conversations 60 feet away. When the system is on, speech becomes unintelligible at a distance of about 20 feet.

STEVE SHANKS
Manager
Denbury Resources, Inc.

Once you have sound masking installed in your office, you wonder how you ever lived without it.

ROBERT HUNT
Facility Manager
Benco Dental