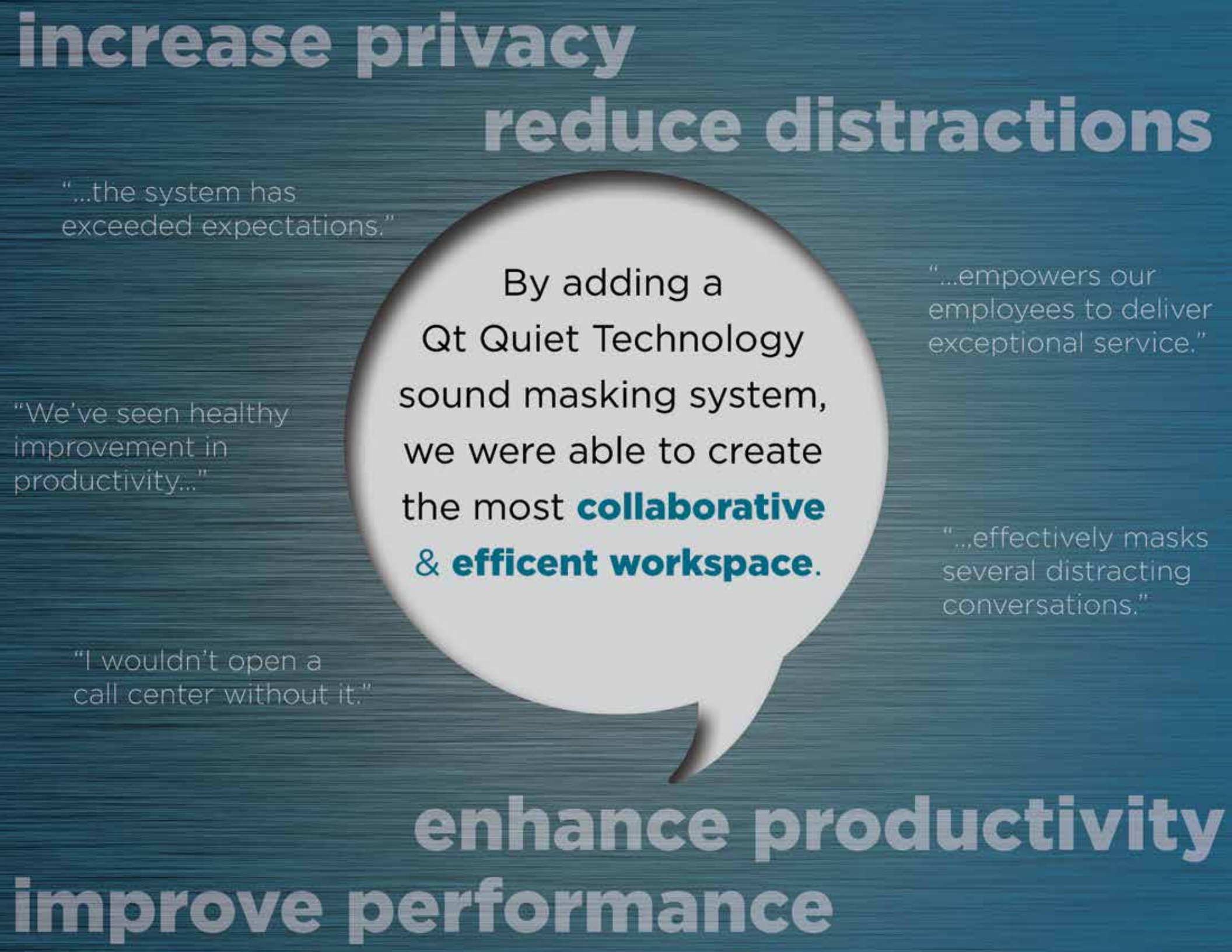
# Rethink Sound Masking

cambridge™
SOUND MANAGEMENT


increase privacy
reduce distractions
"...the system has exceeded expectations."
By adding a Qt Quiet Technology sound masking system, we were able to create the most collaborative & efficent workspace.
"...empowers our employees to deliver exceptional service."
"We've seen healthy improvement in productivity..."
"...effectively masks several distracting conversations."
"I wouldn't open a call center without it."
enhance productivity
improve performance

# introduction

## who are we?

Cambridge Sound Management, LLC (CSM) offers innovative, simple and intelligently engineered solutions to the problems of privacy and acoustic distractions. Our Qt Quiet Technology sound masking systems combine exceptional audio performance, low impact installation, and affordability. Qt™ systems consume less than 24 watts of power per 72,000 square feet (6,689 $m^2$), is GreenSpec listed, and can contribute to your LEED Certification. CSM has a distinguished heritage in the field of acoustics as a descendant of the highly regarded Bolt, Beranek and Newman's acoustics consulting group that was founded in 1948. This group of distinguished acousticians received the American Institute of Architects Honor Award as recognition for having "...created an awareness of acoustical considerations in building design... and integrating solutions based on scientific principles with architectural and artistic concepts."

# contents

# sound masking 101

## why worry about acoustics?

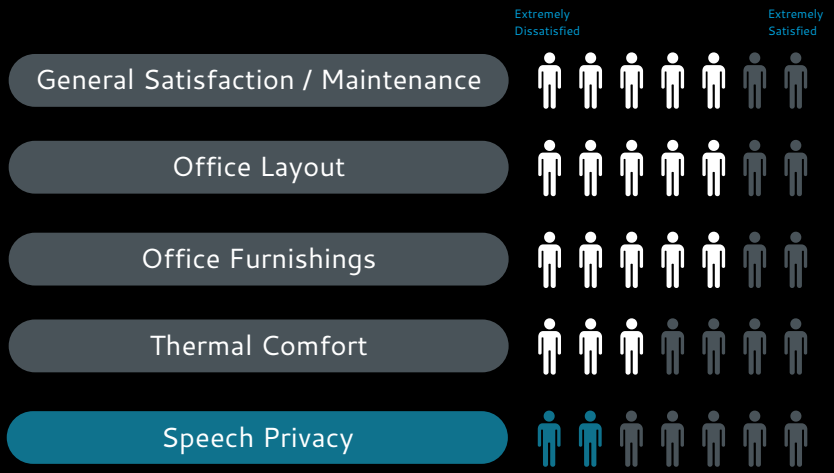
## workplace dissatisfaction

### workers are least satisfied with speech privacy

This chart displays the results from a 2012 General Services Administration's (GSA) workplace research survey.

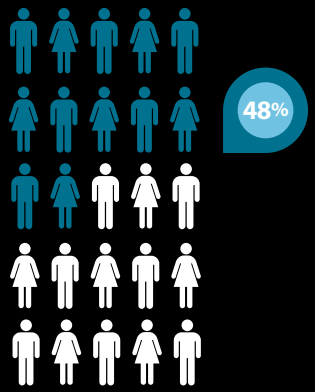
Results from this research study show that acoustic problems are a leading source of employee dissatisfaction in open offices.

Survey participants responded that they did not feel they could have private conversations in their working environment and that this caused more workplace dissatisfaction than office layout, furnishings and even temperature.




## speech distractions

### diminished worker performance




In a recent research survey, 689 employees from 11 companies ranging from call centers to general corporate offices were surveyed regarding workplace comfort.

Researchers found that 48% of participants reported speech as the most distracting source of noise.

These disturbances lead to an increase in clerical mistakes, translating to possible financial or legal issues for the company.

## waste of time

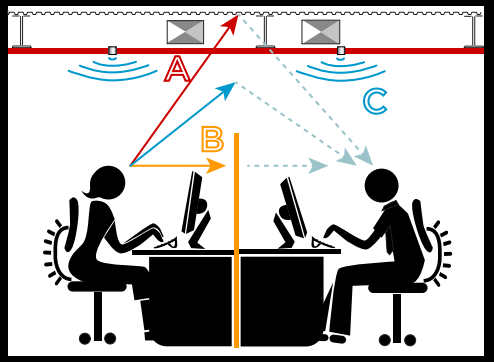
### lower productivity


During the same survey, researchers found that workers lost an average of 21.5 minutes each day to conversational distractions, making speech distractions the number one cause of reduced productivity.

This 5% of lost time each day can equate to significant financial losses in wasted producivity for companies each year.

## ABCs of acoustics

### creating the optimal acoustic environment




When designing an optimal acoustic environment, consultants typically consider a variety of elements referred to as the ABCs of acoustic design. In an ideal environment, the design elements would Absorb, Block, and Cover sound. Consultants balance these elements to reduce conversational distractions while designing an open, aesthetically pleasing office.

Today's offices feature smaller workstations, open office layouts and more reflective surfaces like glass and brick. At the same time, companies increasingly depend on information sharing and effective collaboration to maintain a competitive edge. This challenging environment demands both good acoustic design and the use of sound masking technology to ensure staff and customer comfort.

# sound masking 101

## what is sound masking?

Just as the stars on a dark clear night can be easily seen, many private conversations in the workplace can be easily overheard and understood. As the ambient light increases, the stars appear to fade. Similarly, workplace conversations fade when the ambient sound in the room increases.

**scan to learn more!**

Sound masking is found in the "cover" portion of the ABCs of acoustics. Sound masking is the addition of an uniform background sound, similar to airflow, to reduce the intelligibility of human speech. The resulting environment leads to increased privacy, improved worker performance, enhanced productivity and greater worker comfort.

The privacy index measures the ability of a listener to understand words from someone not intending to be conversing with the listener. The higher the privacy index, the more confidential the talker's conversation becomes.

The privacy index goal is 80% for open office areas and 95% for private offices. The addition of sound masking helps organizations achieve these speech privacy goals.

When someone's conversation is clearly understood, the speech becomes a distraction and the individual speaking has less privacy. The Qt Quiet Technology sound masking system is designed to increase the room's ambient sound, making the talker's voice less intelligible.

As the ambient sound in the room increases, it becomes more challenging to discern an individual's conversation from across the room. This inability to understand the conversation reduces distractions and increases the talker's speech privacy.

# sound masking 101

how effective is sound masking?

## increased speech privacy

### sound masking is a cost effective way to boost speech privacy

This table shows the effectiveness of common types of acoustical treatments. In this example, increases in ceiling tile quality relates to increased absorption, taller cubicle partitions relates to increased blocking, and the implementation of direct field sound masking relates to the increased coverage. The office environment in this example features 8' ceilings and 10'x10' cubicles.

After implementation, direct-field sound masking is the most effective and budget friendly solution for delivering increased speech privacy while reducing conversational distractions.

To learn more or to experiment with a variety of office environments, view our speech privacy calculator at: **www.csmqt.com/learn/speech-privacy-calc**

| Acoustic Environment | sound masking | partition height | ceiling tiles (NRC rating) | avg. privacy index (%) | avg. cost |
|---|---|---|---|---|---|
| Typical Office | no | 48" | .50 | 58.83 | - |
| Increased Absorption | no | 48" | .95 | 73.79 | $$ |
| Increased Blocking | no | 80" | .50 | 81.50 | $$$ |
| Increased Coverage | Yes | 48" | .50 | 87.25 | $ |

## improved worker performance

### reduced distraction and increased comfort lead to improved results

**+ 7.8 %**

word recollection

**+ 8.7 %**

number recollection

In a series of laboratory experiments conducted between 2006 and 2008, researchers examined the effect of speech intelligibility on task performance. This two-year study measured participants' short-term memory recall in a typical open office environment without sound masking versus the same environment with sound masking deployed. The researchers found an 8.7% increase in the participants' ability to recall a series of numbers and a 7.8% increase in recollection of words in the environment with sound masking.

Reduced distractions not only equate to improved worker performance, it also translates into an increase in productivity and less wasted time.




## Applications

Call centers
Counseling offices
Courtrooms
Hotel guest rooms
Houses of worship
Law enforcement
Libraries
Open office areas
Patient rooms
Pharmacies
Private offices
Research laboratories
Retail banks
Secured facilities
Spas
Waiting rooms


# who uses sound masking?

## Industries

Corporate
Healthcare
Finance
Government & Military
Education
Legal
Retail
Hospitality
Venues & Events







# rethink sound masking

## our direct field approach

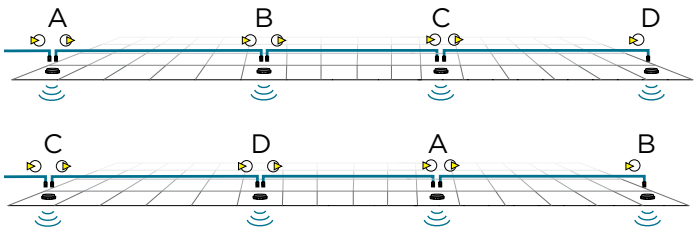
We created and patented our direct field system to remove the unknowns that can make in-plenum system design and installation so challenging.

Our Qt Quiet Technology™ system places the emitters (loudspeakers) in the ceiling and aims the masking sound directly into the space. This simple approach results in better performance, precise coverage, and improved energy efficiency, all with less effort.

And most importantly, our direct field system provides a more comfortable environment for those working in the space.

## patented four channel distribution

Qt emitters provide uniform spatial coverage with four uncorrelated channels, eliminating acoustic interference and the need for complicated design and tuning.



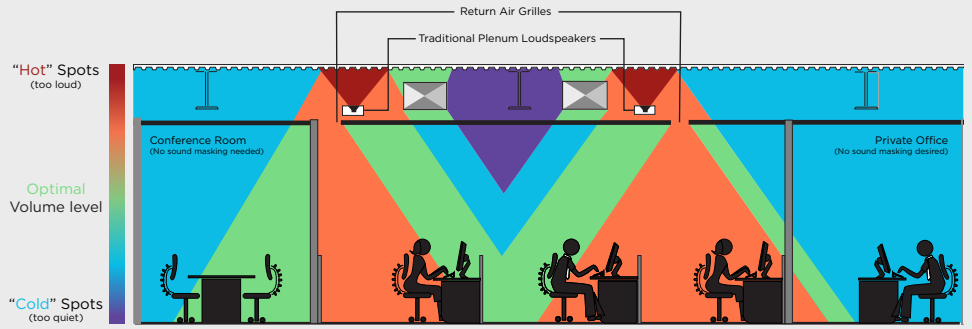

## simple layout, zoning and installation

The Qt system is designed to meet the unique acoustic requirements of a space, whether large or small. Qt emitters are easily installed on a simple grid pattern, determined by ceiling height. The versatile Qt emitters are capable of being mounted to a variety of ceiling types. Emitters are interconnected using pre terminated plenum rated category 3 cables.

During the layout and design phase, the space is divided into zones based on acoustic requirements of the space. Zones can range from 100 square feet (9.3 $m^2$) to 12,000 square feet (1,115 $m^2$). In this example, the office space is separated into three zones, allowing for different volume levels for each unique space.

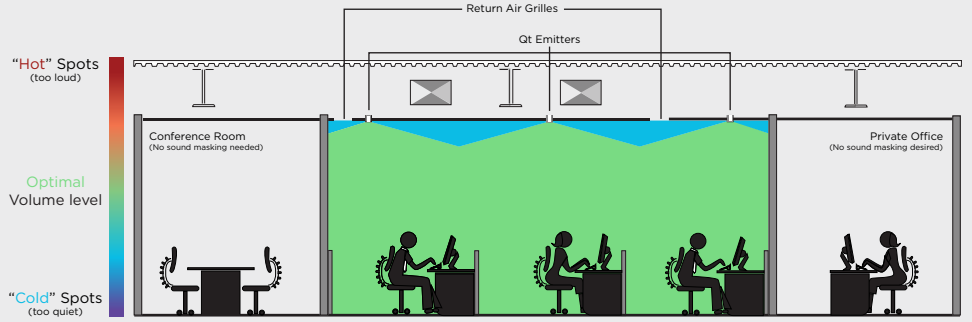
# precise, uniform sound masking

## how do traditional solutions stack up against the Qt sound masking system?




**traditional sound masking system**

Traditional sound masking systems, known as "in-plenum," use large paint can-like loudspeakers installed above the ceiling tiles. Sound is bounced off the ceiling deck, through the ceiling material into the workspace below. The sound from these systems can be unpredictable and create "hot" and "cold" spots. Masking sound can easily overflow into undesired spaces. In-plenum systems require significant design, installation and tuning time because there are many unknowns above the ceiling. If no ceiling exists, there is no plenum for traditional systems to operate within, significantly impacting performance. Additionally, these systems require significantly more power to operate than a Qt system.




**Qt Quiet Technology sound masking system**

With the direct field approach to sound masking, the Qt™ system uniformly disperses the masking sound into the space and eliminates masking sound overflow into undesired areas. The pre-tuned masking sound is emitted through four sequenced channels that eliminate acoustic interference. Additionally, our Qt™ systems deliver more energy in the octave bands that are related to speech, resulting in a more energy efficient system that successfully masks speech at lower volume levels.

# Qt Quiet Technology™

## sound masking systems

Cambridge Sound Management offers a variety of products to enhance the acoustic environment in any type of space. Our Qt Quiet Technology™ sound masking systems enhance privacy and reduce distractions in virtually any space from small offices to large, multi-floor buildings. Qt™ systems integrate paging and music functionality, making this 3-in-1 system a complete solution for creating better acoustic environments.

## advantages of the Qt Quiet Technology sound masking system:

### precise control

Qt™ systems provide precise control over where the masking sound is emitted. This means that sound masking is dispersed only in the spaces in which it is needed, eliminating unwanted spill over into adjacent spaces.

### uniform and comfortable

The Qt system provides a uniform blanket of sound coverage throughout the workspace and is unaffected by ceiling design and the many obstructions that often litter the plenum. The sound is transmitted as four uncorrelated channels, creating a more pleasant and comfortable masking sound.

### versatile

Qt emitters can be installed into any workspace, no matter what type of ceiling is present. The system is designed to grow and change with your business. Qt emitters can be moved and reconfigured with minimal effort and impact when your workspace changes.

### simple, low impact installation

Qt emitters are installed along a simple grid pattern with space determined by ceiling height. In new construction or in existing space, emitters can be installed rapidly and with low impact to the surroundings and little to no down-time for the business.

### energy efficient

The Qt system is the most environmentally friendly sound masking system on the market. All Qt systems are GreenSpec listed and can contribute to LEED certification scores by improving the acoustic environment and mitigating acoustic challenges created by other LEED requirements (i.e. daylight & outdoor views).

### pre tuned, saving valuable time & money

Each Qt system comes pre-tuned with our masking spectrum, specifically calibrated to efficiently mask the frequencies most commonly associated with the human voice.


Qt Quiet Technology™ sound masking systems enhance privacy and reduce distractions in virtually any space from small offices to large, multi-floor buildings. Combined with integrated paging and music functionality, Qt systems are a complete 3-in-1 solution for creating better acoustic environments.

## key features

- 1 zone, 120 emitters
- 1 audio input for paging or music
- integrates with emergency paging systems
- front panel control with LCD
- panel lock (software)
- auto ramping
- four uncorrelated masking channels
- iOS configuration app


# Qt 100
## control module

The Qt 100 is ideal for smaller, single zone spaces of up to 12,000 square feet (1,115 $m^2$).

## technical specifications

- **dimensions (WxHxD):**
  7" x 3.5" x 0.875" (17.8 cm x 8.9 cm x 2.3 cm)
- **weight:**
  6 oz (170 g)
- **max. power output:**
  7 total watts max
- **frequency response:**
  sound masking: 200 Hz to 5 kHz, 1/3rd OBs
  paging & music: 200 Hz to 12.8 kHz, OBs
- **channels:**
  automatic 4 uncorrelated channel distribution
- **auxiliary audio inputs**
  10,000 ohms, line level input (2V max)
- **integrated digital compression:**
  performed via DSP

## standards & certifications

- **ASTM E1130**
- **GreenSpec Listed**
- **UL 60065 compliant**
- **CE compliant**
- **FCC compliant**
- **RoHS compliant**


## key features

- up to 2 zones, 240 emitters
- 1 audio input for paging or music
- front panel control with LCD
- panel lock (hardware)
- four uncorrelated masking channels
- equipment rack mount available

The Qt 200 is ideal for medium sized, one or two zone spaces of up to 24,000 square feet (2,230 $m^2$).

# Qt 200
## control module

## standards & certifications

- **ASTM E1130**
- **GreenSpec Listed**
- **UL 60065 compliant**
- **CE compliant**
- **FCC compliant**
- **RoHS compliant**

## technical specifications

- **dimensions (WxHxD):**
  11" x 3.5" x 3.8" (27.9 cm x 8.9 cm x 9.7 cm)
- **weight:**
  1.5 lbs (680 g)
- **max. power output:**
  2 watts max per zone, 4 total watts max
- **frequency response:**
  sound masking: 200 Hz to 5 kHz, 1/3rd OBs
  paging & music: 200 Hz to 12.8 kHz, OBs
- **channels:**
  automatic 4 uncorrelated channel distribution
- **auxiliary audio inputs**
  5,000 ohms, line level input (2V max)
- **integrated digital compression:**
  performed via DSP

## key features

- up to 6 zones, 120 emitters per zone
- 2 audio inputs for paging and music
- integrates with emergency paging systems
- front panel with LCD or browser-based software control
- panel lock (hardware)
- auto ramping
- time-of-day scheduling
- adjustable equalizer for masking and audio inputs
- four uncorrelated masking channels
- system monitoring and fault detection
- built-in clock with battery backup
- equipment rack mount available


# Qt 600
## control module

The Qt 600 is ideal for medium to large multi-zone spaces of up to 72,000 square feet (6,689 $m^2$). This system is includes monitoring and control software for controlling the module via a TCP/IP connection.

## technical specifications

- **dimensions (WxHxD):**
  13.5” x 3.5” x 3.8” (34.3 cm x 8.9 cm x 9.7 cm)
- **weight:**
  3 lbs (1.4 kg)
- **max. power output:**
  2 watts max per zone, 12 total watts max
- **frequency response:**
  sound masking: 200 Hz to 5 kHz, 1/3rd OBs
  paging & music: 200 Hz to 12.8 kHz, OBs
- **channels:**
  automatic 4 uncorrelated channel distribution
- **auxiliary audio inputs**
  5,000 ohms, line level input (2V max)
- **integrated digital compression:**
  performed via DSP

## standards & certifications

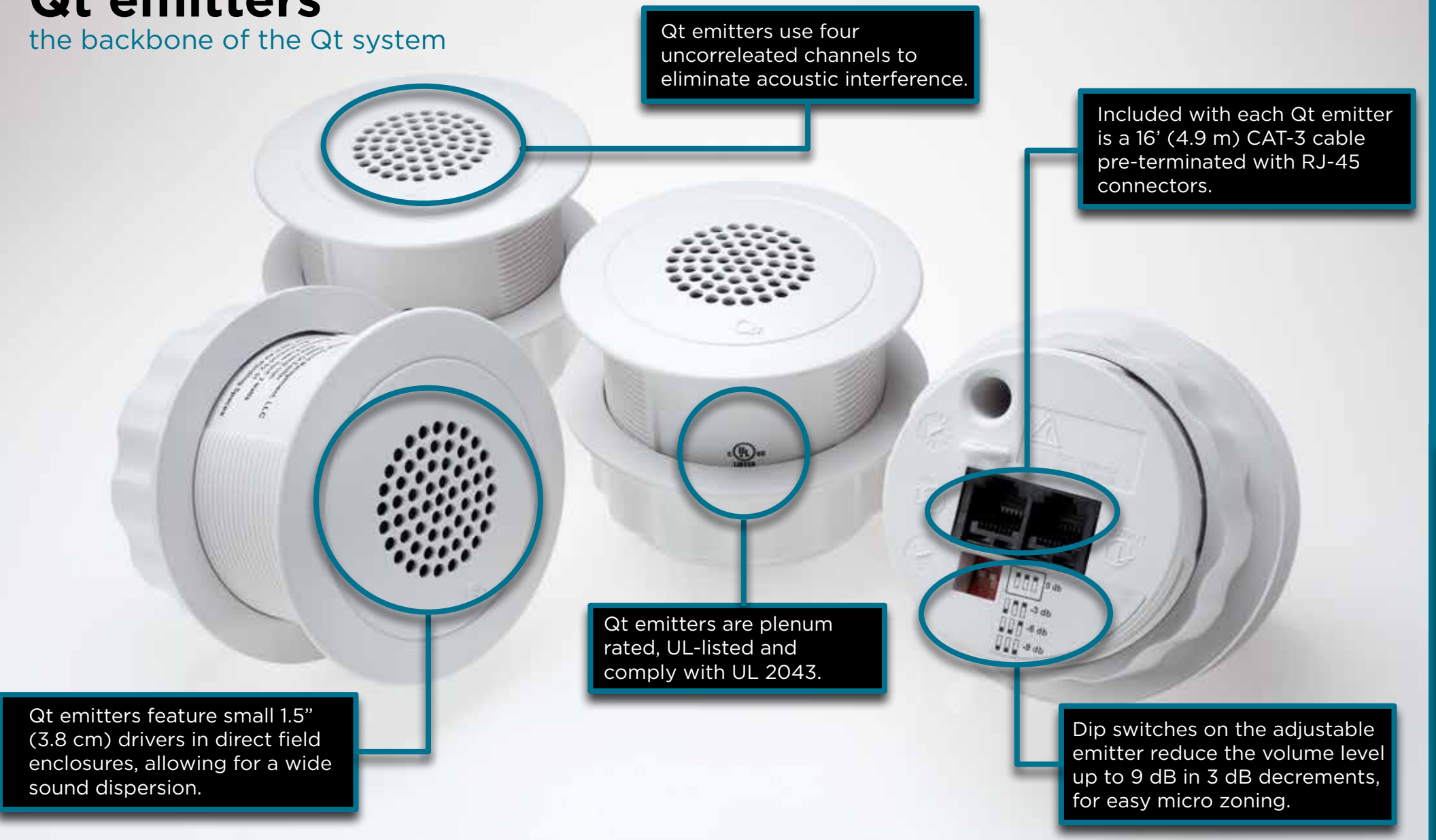
- **ASTM E1130**
- **GreenSpec Listed**
- **UL 60065 compliant**
- **CE compliant**
- **FCC compliant**
- **RoHS compliant**

# Qt Quiet Technology
## system comparison

| | Qt 100 | Qt 200 | Qt 600 |
|---|---|---|---|
| **capacity** | | | |
| zones | 1 | 2 | 6 |
| speakers (max) | 120 | 240 | 720 |
| coverage area (max) | 12,000 $ft^2$ (1,115 $m^2$) | 24,000 $ft^2$ (2,230 $m^2$) | 72,000 $ft^2$ (6,689 $m^2$) |
| **specifications** | | | |
| audio inputs | 1 | 1 | 2 |
| mounting | wall | wall or rack | wall or rack |
| panel lock | software | hardware | hardware |
| internal clock | no | no | yes |
| dimensions | 7" x 3.5" x 0.875" (17.8 cm x 8.9 cm x 2.3 cm) | 11.5" x 3.5" x 3.8" (27.9 cm x 8.9 cm x 9.7 cm) | 13.5" x 3.5" x 3.8" (34.3 cm x 8.9 cm x 9.7 cm) |
| weight | 6 oz (170 g) | 1.5 lbs (680 g) | 3 lbs (1.4 kg) |
| **control** | | | |
| front panel | yes | yes | yes |
| software | no | no | yes |
| TCP/IP access | no | no | yes |
| volume | by zone & input | by zone & input | by zone & input |
| spectrum | no | no | by zone & input |
| passwords | no | no | yes - 2 level |
| **features** | | | |
| day/night levels | no | no | by zone |
| day/night ramping | no | no | by zone |
| auto ramping | yes | no | by zone |
| system monitoring | no | no | electronics and emitters |
| email notification | no | no | yes |
| emergency paging integration | yes | no | yes |

# Qt emitters

## the backbone of the Qt system




Qt emitters are small, wide dispersion direct field speakers. The plug and play emitters may be used interchangeably with all Qt Quiet Technology sound masking systems.

Qt emitters include volume adjustable dip switches for post installation refinements and micro-zoning. The dip switches can decrease the volume level of each emitter by up to 9 dB in 3 dB decrements to compensate for different acoustic conditions within a zone. Qt emitters can provide micro zoning down to 100 square feet (9.3 $m^2$) of space.

# Qt™ emitters

## mounting options and color caps

Acoustical ceiling tile is the most common installation method for the Qt emitter. However, optional mounting brackets allow Qt emitters to be attached to virtually any surface - beams, drywall, metal, wood and others. Additionally, with a color cap, Qt emitters can seamlessly blend in with any decor.

### universal bracket (UB)

This enclosure is used for mounting the Qt emitter to a wood beams or cement ceilings. The bracket cylinder rotates in 45-degree increments for optimal sound dispersion. Available in white or black.

### beam bracket (BB)

This enclosure is used for mounting the Qt emitter to exposed I-beams. Available in white or black.

### conduit mount - drywall (CM)

This enclosure is ideal for mounting the Qt emitter into drywall/ gypsum ceilings in areas requiring conduit mounting.

### drywall mount (DM)

This enclosure is used for mounting the Qt emitter into drywall/ gypsum ceilings.

### plenum back can (PBC)

This enclosure is used for mounting the Qt emitter into acoustic ceiling tile in regions with special fire and/or conduit requirements.

### black & custom color caps

Qt emitter caps can be ordered to match your custom color or can be painted on site, making Qt the only sound masking system flexible enough to fit into any space while preserving the space's aesthetics.

## Qt emitter specifications

**height:** 2.5" (6.35 cm)

**diameter:** 3.25" (8.3 cm)

**weight:** 5.6 oz (159 g)

**color:** white, black* or custom*

**wiring:** plenum rated
CAT 3/5/5A/6 cables

**frequency response:**

sound masking:
200 Hz to 5 kHz, 1/3rd OBs

paging and music:
200 Hz to 12.8 kHz OBs

**SPL output:**
28 - 58 dB at 10' (3.0 m) ceiling height
(on a 10' (3.0 m) grid)

*see black and custom color caps

# our customers

## praise for the Qt Quiet Technology system

Cambridge Sound Management has the best sound masking system on the market and the best customer service in the industry. But don't take our word for it. Take a look at what our customers have to say.

Scan to read our case studies!

Bank of America

*"The Bank of America National Helpline site in Boston houses over 200 associates. Even with all that talking, our work environment is private and productive, thanks to sound masking from Cambridge Sound Management. Their solution is straightforward and effective. I wouldn't open a call center without it."*

**Edward Klemm**
**Vice President, National Helpline**
**Bank of America**

Autodesk

*"The Employees were being distracted by conversations 60 feet away. When the system's on, speech becomes unintelligible at a distance of about 20 feet."*

**Charles Rechtsteiner**
**Regional Facilities Manager**
**Autodesk**

ifm

*"Employees and customers have noted a change in that the space is quieter with fewer distractions. This has not only improved employee productivity, but has also enhanced the customer experience."*

**John Isabell**
**Sales Manager**
**ifm Effector**

**our corporate customers include:**

- Clorox Company
- Dassault Systemes
- General Electric / GE Aviation
- Hasbro
- Microsoft
- Phillips 66
- Southwest Airlines

**our healthcare customers include:**

- Behavioral Health Network
- Chilton Hospital
- Harvard Medical Center
- Mercy Health System
- Spectrum Health System
- Tufts Health System
- Univ. of Colorado Hospital

**our financial customers include:**

- Citibank
- GE Capital
- Merrill Lynch
- Morgan Stanley
- TD Ameritrade
- US Bank
- Wells Fargo

## Williams

*"Libraries are supposed to be quiet, but whispers could be heard 40 feet away. With the help from Cambridge Sound Management, we now have a library that seems quieter and is still beautiful. We are delighted."*

**Bob Jarvis**
**Buildings and Grounds Manager**
**Williams College**

## Citadel

*"Once we installed the Qt Quiet Technology system, the results were nothing short of amazing. Our employees saw a dramatic difference in their ability to concentrate because the system effectively masked distracting conversations."*

**Michelle Kenworthy**
**Real Estate Projects Manager**
**Citadel Federal Credit Union**

## Wentworth-Douglass Hospital

*"The individual acoustical challenges in our open space areas and in our ten private practices are solved with a Qt system. In addition, the two audio inputs enable us to have full paging and music ability throughout the professional center. We were impressed with the low impact of the installation process. With the Qt system in place, there is less distraction from unwanted sounds and conversations. Patients and staff can now experience the positive ambiance we wanted to achieve through the open design concept, and we gained a greater level of patient satisfaction."*

**Alison Brisson**
**Plant Operations Manager**
**Wentworth-Douglas Professional Health Center**

**our government customers include:**

- U. S. Department of Homeland Security
- U. S. General Services Administration
- U. S. Internal Revenue Service
- U. S. Social Security Administration
- U. S. Marine Corps
- National Institutes of Health
- National Geospatial Intelligence Agency

**our education customers include:**

- Harvard University
- Ithaca College
- Massachusetts Institute of Technology
- Northeastern University
- Southern Illinois University Carbondale
- Suffolk University
- Dedham High School

**our retail customers include:**

- Apple Inc.
- Costco
- Goodyear
- Harley Davidson
- Home Depot
- Petco
- Sun Trust

Are you ready to find out how a Qt sound masking system can improve comfort, productivity and privacy in your business?

Scan to request a quote!

MEMTECH ACOUSTICAL, LLC
2175 Avon Industrial Drive
Rochester Hills, MI 48309
PH: 248-289-1123
FAX: 248-289-6317
sales@memtechacoustical.com
www.memtechacoustical.com



p: 2.0 e: 2.0.0