EUREKA

# Acoustic Guide

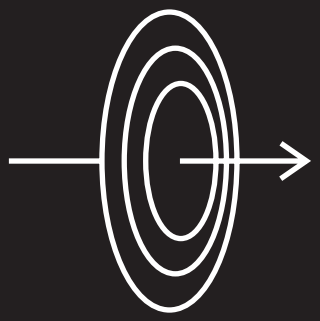
# Acoustic problems





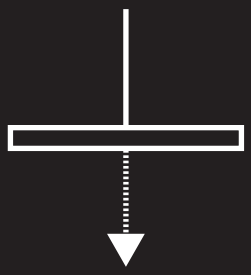
Current interior space trends can lead to increased noise problems. Unfinished ceilings & walls, harder surfaces such as concrete & glass, open office areas, mobile work spaces and impromptu meeting spaces are some of the contributing trends leading to excessive noise in our everyday life.

# Acoustic concepts



**SPEED OF SOUND**

Sound travels at 1000 ft/s, therefore in a 50ft long room, an emitted sound could reflect off hard surfaces up to 60 times before dying out.

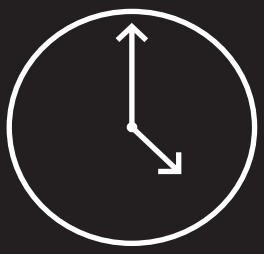


**ABSORPTION**

When sound waves encounter a material made up tiny flexible fibers they move slightly and absorb a portion of the waves in a scale of 0 to 1.

**REVERBERATION**

Delayed sound caused by prolonged reflections is called reverberation. Excess reverberation creates noise issues and reduces the comprehen-sion of speech.



**REVERBERATION TIME**

Different room types & sizes have specific reverberation time recommendations. When they are not met, the addition of sound absorbing materials is an effective method of reaching them.


DIRECT VS. REFLECTED
Reflected sounds can "build up" to a level louder than direct sound and mask them. Late arriving reflections can distort and reduce the comprehension of the direct sound signal. A benefit of quieting a room through sound absorption is that users typically lower their voice, thus reducing direct sounds.
Reflected
Direct

# The quality of the sound environment

Several factors define the acoustical requirements of a space in addition to recommended acoustic values and calculations which are related to the type of activities and the requirements of the activities and people present.

**SOUND PATH FACTORS**

- Room materials
- Distance
- Sound barriers
- Reverberation
- Sound absorption
- Background noises
- Room shape & volume

**RECEIVER INFLUENCES**

- Task requirements
- Sound familiarity
- Level of concentration
- Hearing ability
- Auditory volume received
- Clarity of sounds

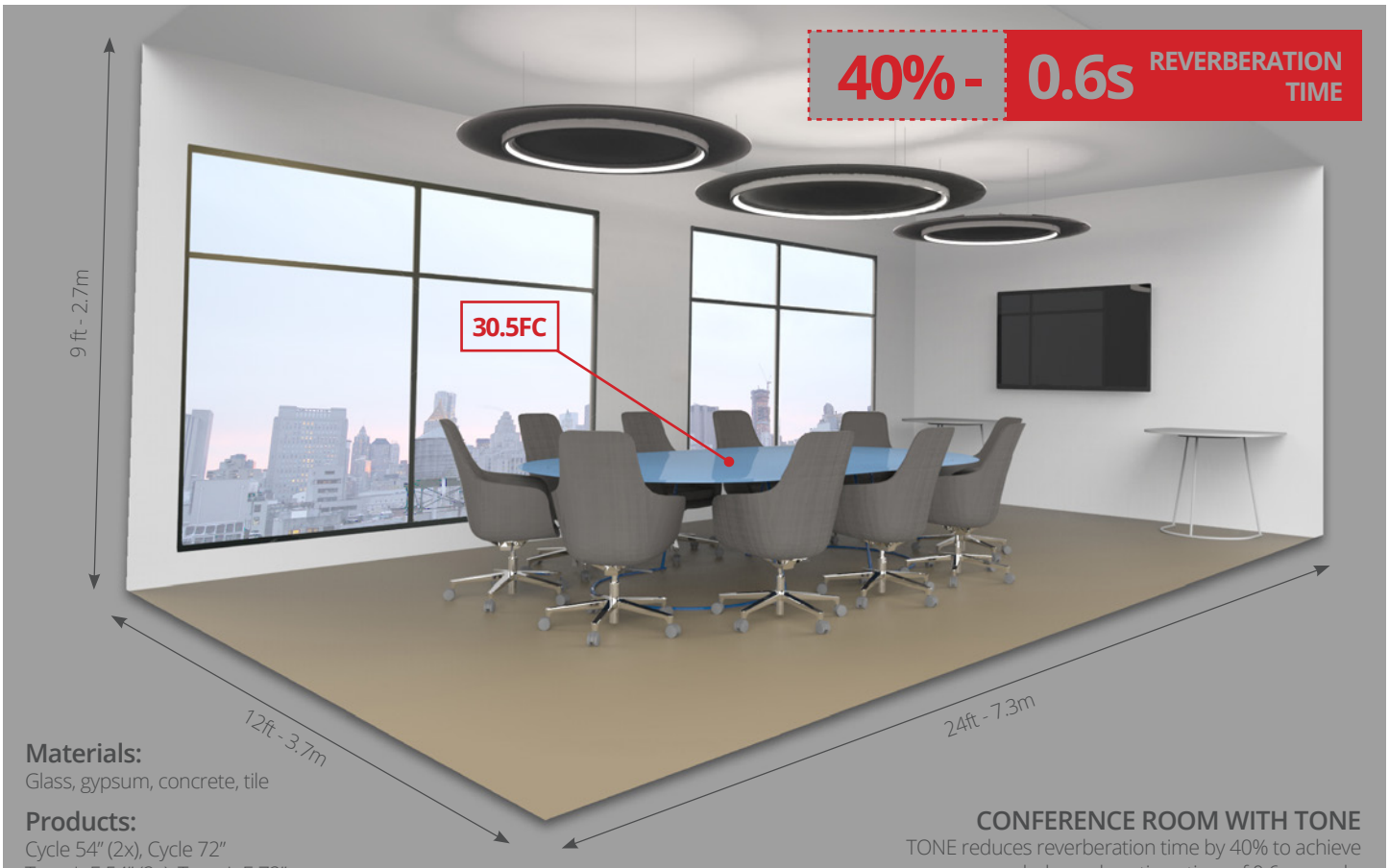
**EMITTER FACTORS**

- Auditory strength
- Volume variation
- Voice pitch & tone
- Orientation
- Occurence frequency
- Duration


**Materials:**
Glass, gypsum, concrete, tile

**Products:**
Cycle 54" (2x), Cycle 72"

**CASE STUDY : CONFERENCE ROOM**
A conference room with hard surface materials excessively reflects the voices of the users reducing speech comprehension and quality. The solution is to absorb relfected sounds and bring the reverberation time to an accepted level of 0.6 seconds.




**Materials:**
Glass, gypsum, concrete, tile

**Products:**
Cycle 54" (2x), Cycle 72"
Tone I+E 54" (2x), Tone I+E 72"

**CONFERENCE ROOM WITH TONE**
TONE reduces reverberation time by 40% to achieve recommended reverberations time of 0.6 seconds.

# Our acoustical offering

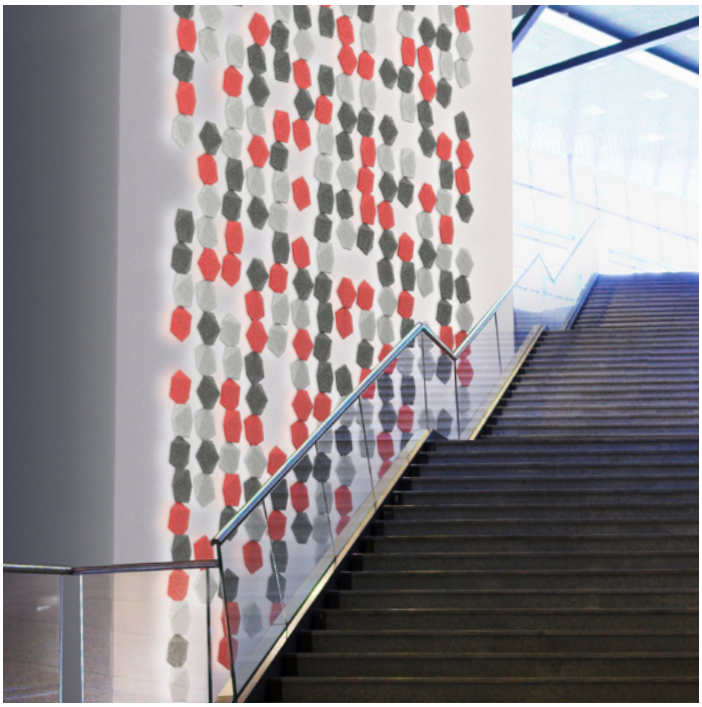
We have developed several luminaires with sound absorbing properties. Each one incorporates an acoustical material in a different way and with different luminaire formats to provide a variety of inspiring solutions for our clients.

## OSLO 3038 - 4238

Warm and delicate, this large surface sconce features front and back light giving a nicely toned atmosphere to interior spaces. Made out of formed recycled acoustical PET felt, the shape evokes the effect of rippling water.

**KEY FEATURES:**

- An elegant lighting effect which benefits room acoustics
- The acoustical absorption of the wall mounted Oslo complements suspended acoustical luminaires.
- Available in 3 colors: Red, charcoal and silver grey and features a white or anthracite front plate.
- Designed with front as well as rear illumination, the Oslo features a 24W LED light source and standard 0-10V dimming.
- Tested noise reduction coefficient for material of 0.75 NRC
- Composed of polyester (PET) fibers with 42% recycled content
- 100% recyclable, low VOC & fire rated material
- Non-toxic, non-allergenic & non-irritable
- Dual-sided surface which is lightweight, durable, rigid & stable



## NODE 3446

Compose an original pattern of light with these warmly diffused and soft to the touch hexagonal shapes. Create your personal motif using one or several sets of up to 12 Nodes at varying angles to add a large unique ambient lighting pattern and inspiration to your space.

**KEY FEATURES:**

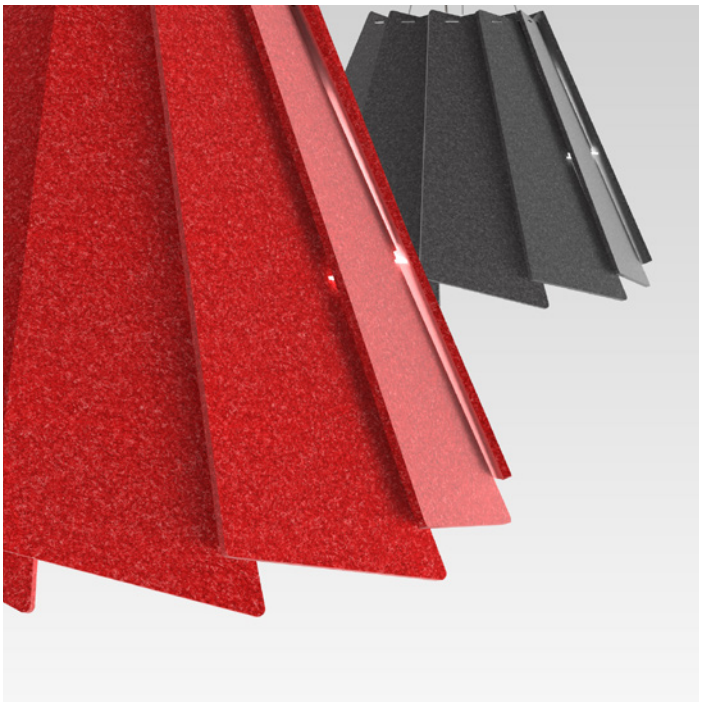
- Allows the creation of a personalized pattern of lighting and acoustic panels
- An elegant solution for improved acoustics and ambient lighting
- Available in 2 sizes & 3 colors: Red, charcoal and silver grey
- Tested noise reduction coefficient for material of 0.75 NRC
- Composed of polyester (PET) fibers with 42% recycled content
- 100% recyclable, low VOC & fire rated material
- Non-toxic, non-allergenic & non-irritable
- Lightweight, durable, rigid & stable
- Dual-sided absorption surfaces

# MATRIX 3525

An impressive example of modularity and flexibility, this sound absorbing mural system allows the creation of a colorful mosaic, punctuated with OLED light sources. The luminous modules are movable and can playfully be rearranged on the spot with the use of its simple and intuitive magnetic connection.

**KEY FEATURES:**

- A multi-featured product with high-tech lighting, playful modularity and acoustical absorption
- Covered with thick acoustical polyester felt panels offered in cold and warm color group options
- Offers a large visual impact in a room, with a flexible panel arrangement for a variety of pattern effects on a wall
- Tested noise reduction coefficient for material of 0.75 NRC
- Face panel of polyester (PET) fibers made with recycled content
- 100% recyclable, low VOC & fire rated material
- Non-toxic, non-allergenic & non-irritable
- Lightweight, durable, rigid & stable



# MUTE 4258

This soft and colorful large format pendant is composed of twelve felt-like acoustic panels to illuminate and decorate your space with the added benefeit of sound absorption.

**KEY FEATURES:**

- Composed of 12 easy to install sound absorbing panels
- Available in 3 colors: Charcoal, Beige or Red
- Custom 24W LED module 3000K or 4000K color temperature
- Frosted acrylic lens for superior light transmission
- Tested noise reduction coefficient for material of 0.75 NRC
- Composed of polyester (PET) fibers with 42% recycled content
- Panels are 100% recyclable
- Low VOC & fire rated material
- Non-toxic, non-allergenic & non-irritable
- Lightweight, durable, rigid & stable
- Dual-sided absorption surfaces


# TONE 2990

Enhance the acoustics of your space easily by adding the Tone accessory on our Cycle luminaires (sold separately) to reduce ambient noise and absorb background chatters.

### KEY FEATURES:

- A simple solution to improve room acoustics
- Installs quickly without tools
- Minimal visual impact on room
- Tested noise reduction coefficient for material of 0.75 NRC.
- Composed of polyester (PET) fibers with 42% recycled content
- 100% recyclable
- Low VOC & fire rated material
- Non-toxic, non-allergenic & non-irritable
- Lightweight, durable, rigid & stable
- Dual-sided absorption surfaces

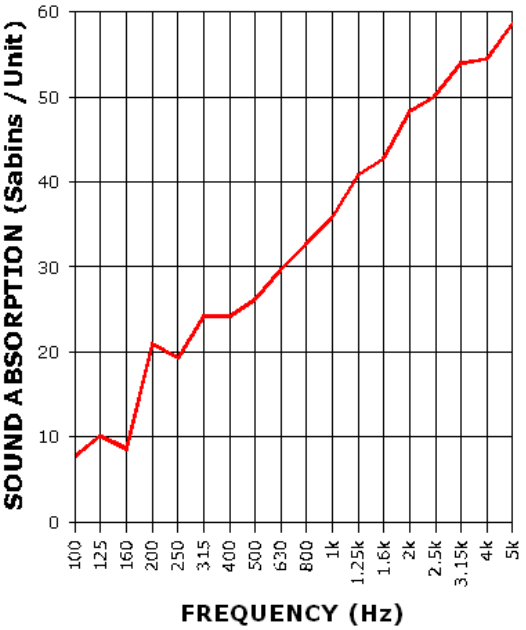
# Acoustical testing lab results

### CERTIFIED LAB TESTING SHOWS THE PERFORMANCE OF OUR ACOUSTICAL PRODUCTS

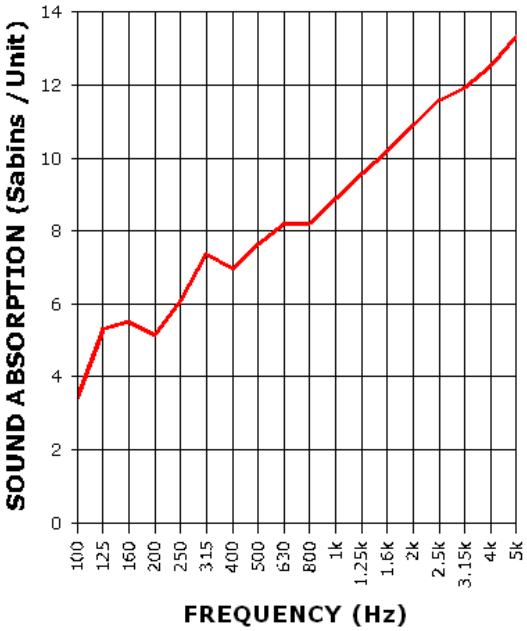
The ASTM C423-09a Tests for sound absorption were performed by the world renowned Riverbank Acoustical Laboratories. The tests measured the amount of sound absorption and the absorption coefficients at frequencies spanning from 100 to 5000Hz. The results can be used to calculate the acoustical impact for specific room sizes and characteristics.

See more information in the product brochures.

**SOUND ABSORPTION REPORT**
Acoustic Cycle




**SOUND ABSORPTION REPORT**
30" Thick Mute

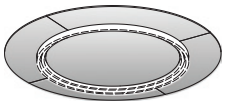


# Acoustical lab results

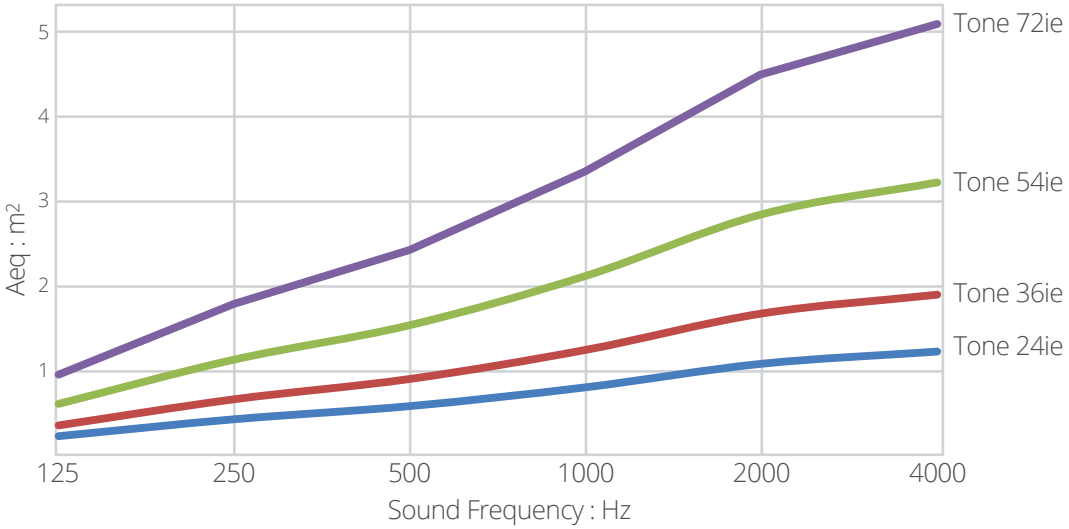
Test : ASTM C423-09a : Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method. Full lab report available on request.

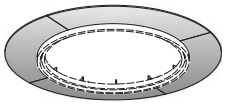
Test lab : Riverbank Acoustical Laboratories : NVLAP, ISO 17025:2005. Test number RAL-A15-347

| **Absorption Coefficient** | .21 | .39 | .53 | .73 | .98 | 1.11 | 1.23 |
|---|---|---|---|---|---|---|---|
| **Frequency : Hz** | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
| **Apparent NRC** | 0.65 | | | | | | |
| **Apparent SAA** | 0.67 | | | | | | |

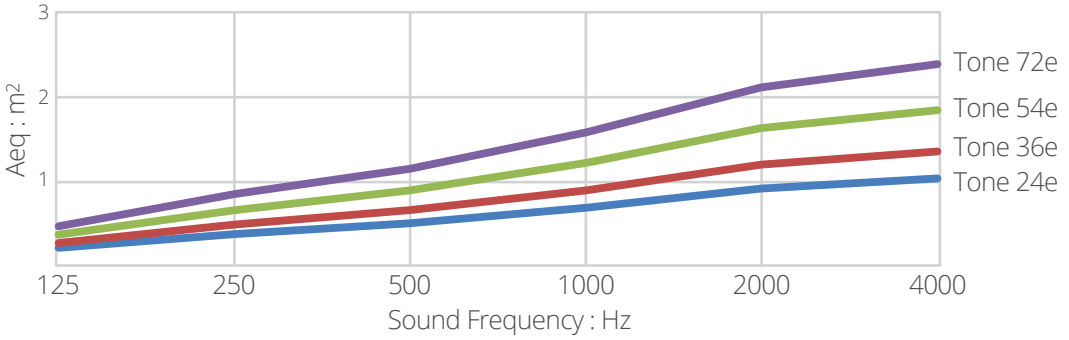


**TONE INTERIOR + EXTERIOR**
Aeq : Equivalent sound absorption Area in $m^2$

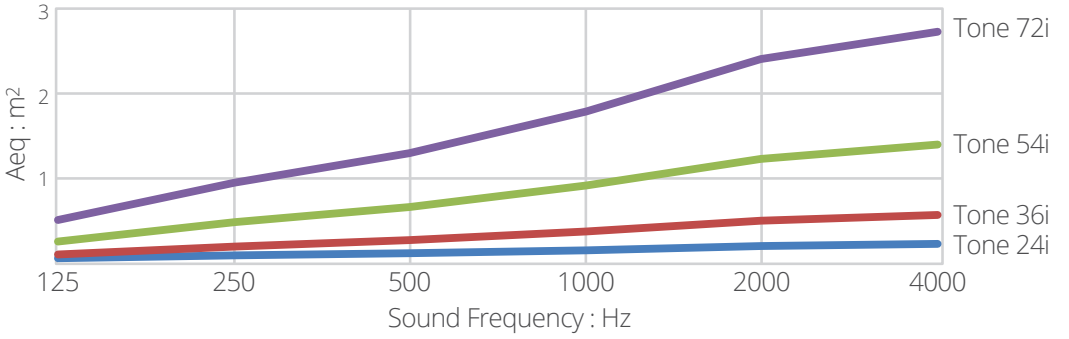


**TONE EXTERIOR**
Aeq : Equivalent sound absorption Area in $m^2$




**TONE INTERIOR**
Aeq : Equivalent sound absorption Area in m2



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