[SHAPER SENSE]

ACOUSTIC LIGHTING

COOPER
Lighting Solutions

INIMITABLE

/iˈnimədəb(ə)l/

adjective
so good or unusual as to be impossible to copy; unique.

Shaper Sense is a new line of lighting products that integrate lighting and acoustic sound absorption materials together. Partnering with FilzFelt, a natural materials and acoustics leader, has led to innovative, award winning, yet simple product designs that meet the needs of open spaces where unwanted noise has become an issue. The solution based strategy of high performance lighting along with the industries highest level of sound absorbing materials and the widest array of color selections, within simple forms, give maximum freedom in design.

Introducing Shaper Sense:
A line of award winning acoustic lighting products.

ARCHITECT

Architect Magazine – 2019 Spring Collection Selection

Best of NeoCon Gold – Lighting: Hospitality and Decorative

Product Innovation Award (PIA) – Architectural SSL Magazine

Illuminating Engineering Society (IES) Progress Report Selection 2019

Product Innovation Award (PIA) – Architectural Products Magazine

LEDs Magazine – Sapphire Awards Finalist

"Great design, great acoustics, and great finish options all in one. Finally, lighting and acoustic solutions integrated into one seamless design with performance for the workplace. A win for our clients. A win for design."

Richard S.
Principal
Denver, CO

WHAT IS SHAPER? AND DOES IT MAKE SENSE?

SHAPER

The ethos of decorative products that solve customer problems through differentiated design and integrated technology.

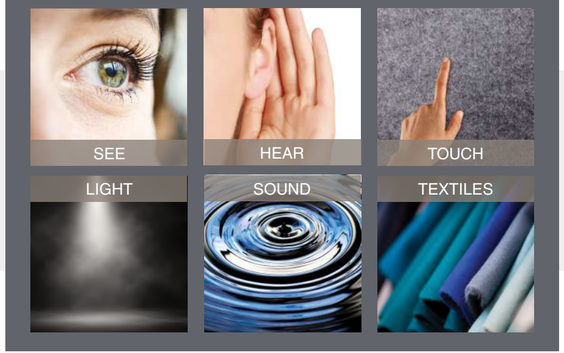
INTRODUCING SHAPER SENSE

An ensemble of products that coalesce the physical senses of sight, sound, and touch, to produce outputs of illuminance, sound absorption, and texture with controls, from one platform.

SENSE

A sense is a physiological capacity of organisms that provide data for perception.

The decorative collection of Shaper Sense fixtures are designed to invoke the human senses of sight, hearing, and touch. In partnership with industry leading acoustic and natural materials company, FilzFelt™, the edgelit luminaires are an ensemble of integrated LED lighting and acoustic products with 100% Wool Design Felt.



This combination provides a collection of products of high aesthetic appeal, visual performance, and quality acoustic surrounds. The simple shapes (Box and Trapezoid) combined with 96 dynamic felt color selections, allow designers to choose and form countless looks, creating their own solutions for a space.

A CONFLUENCE OF
LIGHT + SOUND

Workspace office design has gone through a revolution from high wall cubicles to flexible-modular open office plans that promote collaboration and communication. A byproduct of this design has resulted in some unwanted noise causing disruption and distractions that can lead to lower productivity and dissatisfaction of the workspace environment.

By addressing the physiological components of lighting and noise from Maslow"s Hierarchy of Needs applied to workplace strategy, the development of integrating lighting and sound absorption materials from one platform becomes an ideal solution to help combat increasing noise and disruption in the work place.

The Shaper Sense family of products provides simplistic shapes, with dynamic color selections that can match other materials in the space or become a highlight on their own. In spaces that use FilzFelt sound absorbing products, Shaper Sense products are a natural complement to the environment. The natural material colors can be used in these large-scale voluminous fixtures to be calming, as well as using the vibrant color selections to make loud visual statements that can help create visual collaboration cues, way finding purpose, or space delineation. The optional addition of Wavelinx wireless controls platform, adds a third layer of flexible and desirable architectural space solutions.

The first series of products utilize a square light engine that is surrounded by acoustic materials in a box shape and trapezoid shape. Each shape has different color elements that can be selectable. The Shaper Sense Box fixture has a top and bottom panel that can have different felt colors, or can simply have the same felt color. The trapezoid has opposing pairs of panels for different felt color selection, or can be the same.

Color is a strong design element. Shaper Sense products partnered with Filzfelt, provides the widest palette of colors available for acoustic lighting solutions. Using color can help distinguish spacial design and can be highly impactful. In this scenario - color helps to distinguish collaborative spaces vs. work stations. The same product is used, but color helps define visual insight.

- **Office**
- **Co-Working**

Shaper Sense Box

THE filzfelt DIFFERENCE

FilzFelt is an industry leading natural textile and acoustic products company that provides industry leading material performance. The color palette offering of 96 100% Wool Design Felt colors choices are used in the Shaper Sense products, creating thousands of dynamic color variable options. This lets the design teams add value and design choices that work for their spaces. FilzFelt's 100% Wool Design Felt, is moisture resistant, self-extinguishing and known for its thermal and acoustic insulation properties and its highly saturated and lightfast colors. Wool felt is a nonwoven textile that has warmed, sheltered, protected and comforted human beings for centuries.

This natural material has inherent durability and beauty that cannot be achieved with synthetic fibers. The 100% Wool Design Felt brings this ancient fabric into the 21st century where it balances beauty, utility and sustainability while meeting the challenging needs of modern spaces. Warranty on FilzFelt acoustic materials are 5 years.

WHO IS FILZFELT? | WHAT IS FELT? | HOW IS FELT MADE?

MILLER TIME

Felt is produced in buildings termed as "mills". Traditionally these mills were located in rural areas where the wool was easily attainable adjacent to a source of water. Producing wool felt is an extensive and specialized where only a handful of wool felt mills exist today utilizing the same process (and many times, the machinery) that has been used for over a century.

SHEEP!

Wool is a natural fiber harvested from sheep. Sheep's wool is highly regarded for its crimped, elastic fibers that are easily felted to form a fabric that cannot be pulled apart. This translates into durability, excellent dye ability, resistance to flame and compression, and thermal and sound insulation. Plus, this natural fiber is a rapidly renewable resource (it grows back!) and is 100% biodegradable.

FilzFelt's felts are manufactured from Merino wool that is typically sourced primarily from Australia, New Zealand, and South Africa. Merino sheep are prized for their fine hair and considered to be the highest quality sheep's wool. Most sheep are sheared once a year (in spring or early summer) as it takes a full year to grow back.

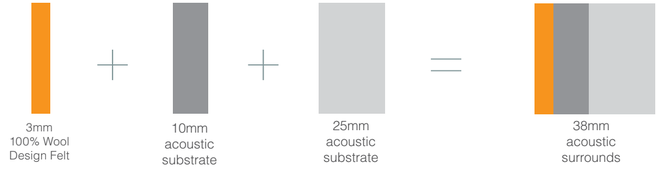
CHOICES... 96 OF THEM!

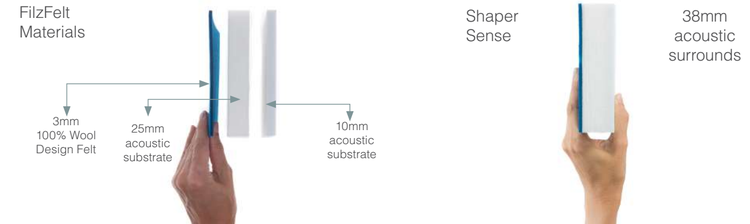
100% Wool Design Felt - 96 felt color choices on par and trend.

Wool felt is one of the oldest man-made textiles and to produce felt, raw wool undergoes a wet "felting" process, which involves matting, condensing and pressing the fibers. 100% Wool Design Felt is a high quality natural material, comes in highly saturated colors, and is perfect for demanding design applications. The proprietary process for developing the widest range of various felt colors is what propels FilzFelt to be an industry leader. 100% Wool Design Felt is 100% biodegradable, contains no formaldehyde, 100% VOC free, no chemical irritants, free of harmful substances 100% Wool Design Felt contributes to LEED© v4

WHY IT WORKS

Our definition of "Substrate" is a recycled PET plastic made from items like plastic bottles. These are broken down and made into sound absorbing materials that are industry leading. These substrates contain a minimum of 60% recycled content, and are 100% recyclable in themselves. The "Shaper Sense" products use sound absorbing substrates in combination with sound absorbing colorful felt to bring a richness and depth to the aesthetic value of the product, that sets itself apart.





PICK ME!

The Shaper Sense Box has a top panel from which 96 of the 100% Wool Design Felt choices can be selected. The bottom panel also allows for the same number of selections of colors. These can then be the same for a uniform look, or very different... creating contrast and depth.

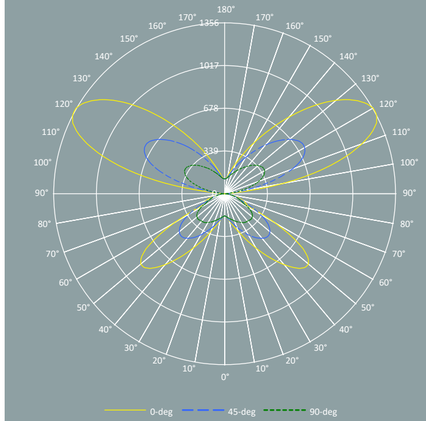
Light Level 1 – 30W

2480 lumens	3000K @ 90 CRI	3000K	90
3084 lumens	3500K @ 80 CRI	3500K	80
3028 lumens	4000K @ 80 CRI	4000K	80

Light Level 2 – 39W

3172 lumens	3000K @ 90 CRI	3000K	90
3944 lumens	3500K @ 80 CRI	3500K	80
3873 lumens	4000K @ 80 CRI	4000K	80

THE SHAPE OF LIGHT – POLAR PLOT



Test Method: LM-79-08
Catalog Number: ShSe-BOX-2-L35-80-UNV-STD
Description: SHAPER SENSE BOX LIGHT LEVEL 2
Light Source: 3500K CCT, 80 CRI LEDS

Summary
Luminaire Lumens: 3955 lumens
Efficacy: 101.7 lumens/watt
Input Watts (W): 38.8

Color Vector Graphics - TM-30

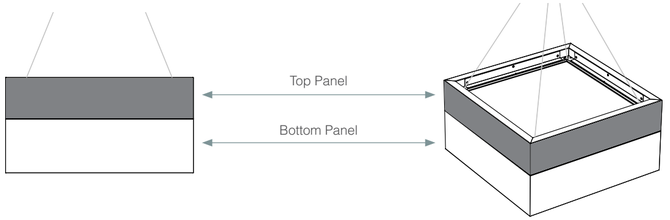
Fidelity - Rf: 81
Gamut - Rg: 95.9

Reference Illuminanat
Test Source

HOW TO PICK SHAPER SENSE BOX COLORS

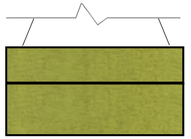
For contrasting colors, choose different colors for the top panel and the bottom panel.
For a monochromatic effect, select the same color for both top and bottom panels.

Select Top Panel + Color Selection from chart on page 28.
Select Bottom Panel + Color Selection from chart on page 28.



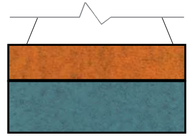
EXAMPLE OF MONO-TONE

Top Panel TP713 = 713 Kiwi
Bottom Panel BP713 = 713 Kiwi

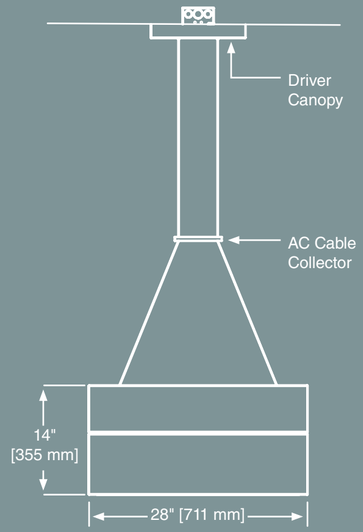


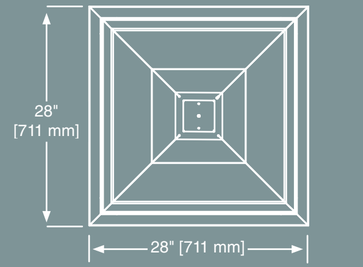
EXAMPLE OF TWO-TONE

Top Panel TP116 = 116 Orange
Bottom Panel BP312 = 312 Lagune



See page 28 for color selection numbers





NO...PICK ME!

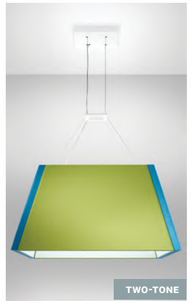
The Shaper Sense Trapezoid has opposing pairs of panel from which 96 of the 100% Wool Design Felt choices can be selected. From one side, a solid panel look is created. Turn the corner, and a contrast of color can be achieved. Or, select all panels to be the same for a uniform look

Light Level 1 – 30W

2487 lumens	3000K @ 90 CRI	3000K	90
3092 lumens	3500K @ 80 CRI	3500K	80
3036 lumens	4000K @ 80 CRI	4000K	80

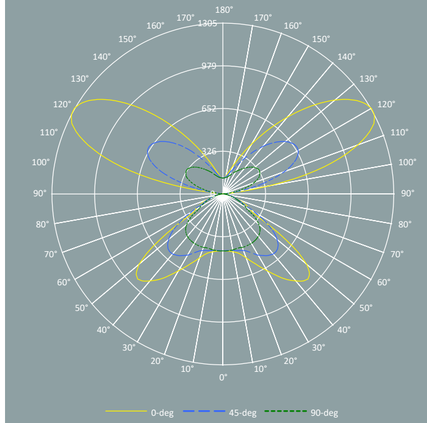
Light Level 2 – 39W

3182 lumens	3000K @ 90 CRI	3000K	90
3955 lumens	3500K @ 80 CRI	3500K	80
3884 lumens	4000K @ 80 CRI	4000K	80



30W
39W

THE SHAPE OF LIGHT – POLAR PLOT



Test Method: LM-79-08
Catalog Number: ShSe-TRAP-2-L35-80-UNV-STD
Description: SHAPER SENSE TRAPEZOID LIGHT LEVEL 2
Light Source: 3500K CCT, 80 CRI LEDS

Summary
Luminaire Lumens: 3955 lumens
Efficacy: 101.9 lumens/watt
Input Watts (W): 38.8

Color Vector Graphics - TM-30

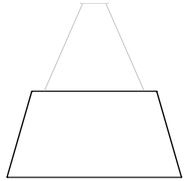
Fidelity - Rf: 81
Gamut - Rg: 95.9

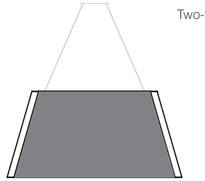
Reference Illuminant
Test Source

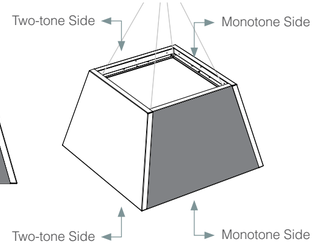
HOW TO PICK SHAPER SENSE TRAPEZOID COLORS

For contrasting colors, choose different colors for the top panel and the bottom panel.
For a monochromatic effect, select the same color for both top and bottom panels.

Select side AA Panels + Color Selection from chart page 29.
Select side BB Panels + Color Selection from chart page 29.


Monotone


Two-Tone

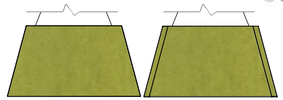


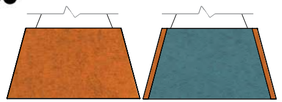
EXAMPLE OF MONO-TONE

Side AA = 713 Kiwi
Side BB = 713 Kiwi

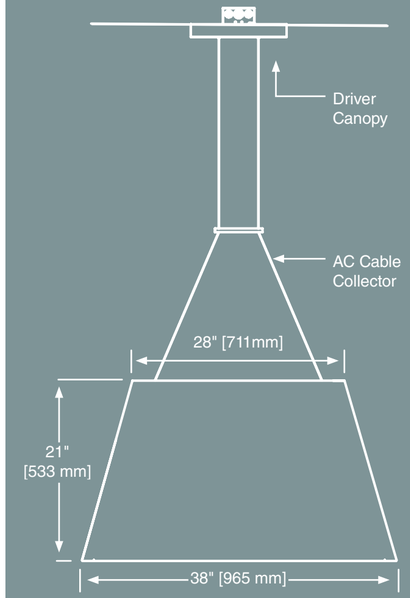
EXAMPLE OF TWO-TONE

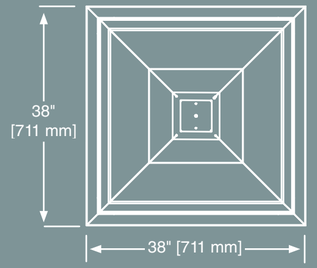
Side AA116 = 116 Orange
Side BB312 = 312 Lagune





See page 29 for color selection numbers





SOUND VALUES

For the Shaper Sense Box and Trapezoid fixtures the Noise Reduction Coefficient and Sound Absorption Average are calculated based on a range of frequency bands pertinent to human speech.

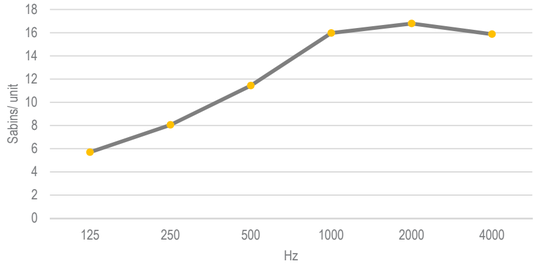
Testing Testing 1,2,3

Acoustic testing performed at industry leading NVLAP accredited labs.

NGC TESTING SERVICES
ACOUSTICAL • FIRE • STRUCTURAL • ANALYTICAL

Riverbank Acoustical Laboratories
An ALION Technical Center

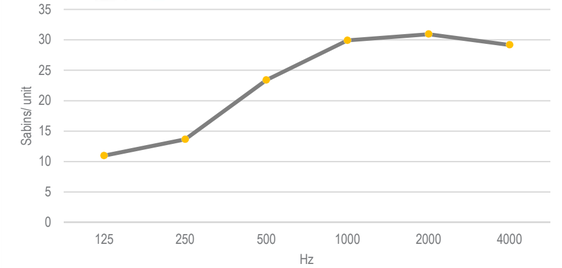
Shaper Sense Box



Shaper Sense Box
Apparent Noise Reduction Coefficient (NRC): 1.2
Apparent Sound Absorption Average (SAA): 1.19

Hz	Sabins/ Unit
125	5.7
250	8.05
500	11.44
1000	15.97
2000	16.79
4000	15.87

Shaper Sense Trap



Shaper Sense Trap
Apparent Noise Reduction Coefficient (NRC): 1.4
Apparent Sound Absorption Average (SAA): 1.38

Hz	Sabins/ Unit
125	10.97
250	13.65
500	23.39
1000	29.91
2000	30.93
4000	29.16

In spaces that use FilzFelt sound absorbing products, Shaper Sense products are a natural complement to the space. The calm natural material colors can be used in these large-scale voluminous fixtures to be calming, as well as using the vibrant color selections to make loud visual statements that can help create visual collaboration cues, or way finding purpose, or space delineation. Used in conjunction together these products help reduce unwanted reverberation.

- **Open Space**
- **Hospitality**

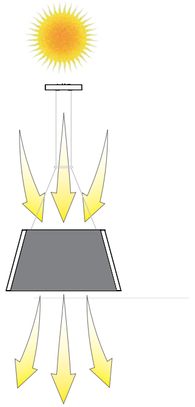
Shaper Sense Box

I SEE YOU!

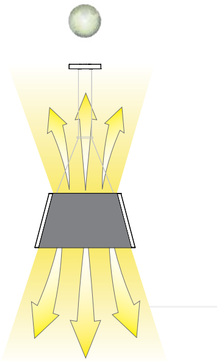
The concept of OPEN design takes a step further in the development of a translucent light engine that is edge lit using high powered LEDs. The The Shaper Sense Box and Trapezoid fixtures allow natural daylight to pass through preventing a dark and ominous feel from these large scale products. When the fixtures are on, they provide uplight and downlight for ambient task lighting. And when using the daylight harvesting feature from the wireless sensor platforms, can maintain illuminance as day turns to night.

85% translucent lens

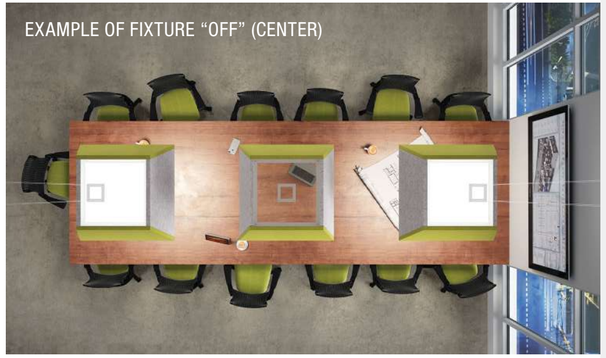
A window…Natural Light can pass through. the light engine “OFF”



Illuminated light fully “ON"



EXAMPLE OF FIXTURE “OFF” (CENTER)



- **Conference Room**
- **Collaboration Space**

Shaper Sense Trapezoid

A great use for the Shaper Sense products are in conference rooms that tend to be open and airy. Reverberation in these spaces can be high, and when the main agenda for this application is to communicate, Shaper Sense acoustic lighting products are a natural fit.

EXAMPLE OF FIXTURE “ON” (ALL)

WIRELESS SENSING SENSORS

Shaper Sense acoustic lighting products are able to use Cooper Lighting’s wireless controls platforms of WaveLinx and LumaWatt Pro.

WAVELINX

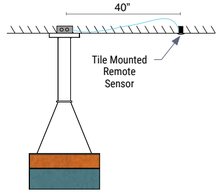
The WaveLinx tile mount sensor option is an integral part of the WaveLinx Wireless Connected Lighting System and offers 3 amp relay control and continuous 0-10V dimming of Shaper Sense luminaires. The tile mount sensor provides daylight dimming and control for a single luminaire or can be daisy chained for group luminaire control. The sensor’s control module allows simple electrical Junction Box mounting via ½” knock out or direct connection to the junction box attached to the Shaper luminaire. The WaveLinx Tile mount daylight sensor operates on a wireless mesh network based on IEEE 802.15.4 standards and is controlled by a WaveLinx Wireless Area Controller.

LUMAWATT PRO

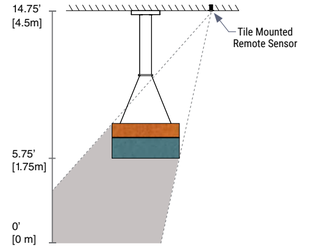
The LumaWatt Pro Tile mount sensor option is field installed to a single luminaires junction box or daisy chained to a group of luminaires, providing lighting control and sensing in an independent, fault-proof, resilient networks of powerful end-points. Sensors have profiles stored internally containing all of the variables for the application once a configuration is set and is able to manage the fixture without connectivity to the system. The sensors gather data from four on-board inputs: Passive infrared occupancy detection, daylight, temperature, and electrical current use. Wireless gateways communicate with the sensors and transmit the data using industry-standard wired technology to the Energy Manager, for powerful, familiar dashboards of information tailored for access on a connected computer. Energy Managers connect to optional cloud-based applications, maximizing the dense, data-rich sensing within the footprint of the luminaire for management of the building environment, and much more.

SENSOR MOUNTING AND COVERAGE

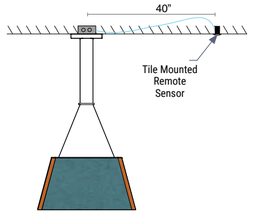
Sensor mounting and coverage for BOX



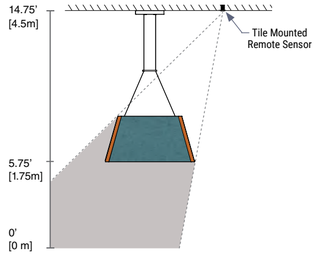
Reduced Occupancy Detection Area for BOX

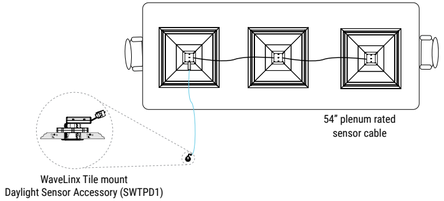


Sensor mounting and coverage for TRAPEZOID



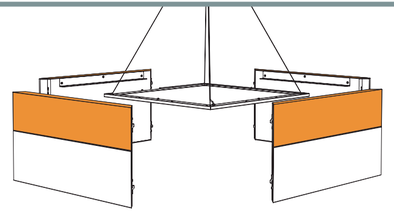
Reduced Occupancy Detection Area for TRAPEZOID





SHUT THE BOX UP...

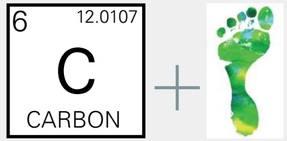
FLAT PACK DESIGN AND THEN SOME



Part of the ingenious and patented design is how the product assembles and ultimately ships. Each acoustic light fixture consists of one translucent light engine and four acoustic panels. They arrive to the job site in two separate boxes. By having individual acoustic panels, they can be laid flat, and be “flat packed” to minimize transportation costs as well as less impact on the environment.

PARTS FOR ONE FIXTURE

The unique use of recycled sound absorption materials, renewable felt that is 100% recyclable, and minimalistic industrial design, contribute to lower transportation costs, and even lower carbon foot print (less CO2 emissions affecting our planet.). Shaper Sense products just feel good to use.



REDUCED CARBON FOOT PRINT

(We know this is really about carbon emissions – but the logo is too cool).

HEAR TO RECYCLE

The sound absorbing substrate used in the Shaper Sense products are made from recycling plastics. The acoustic substrate from FilzFelt, contains a minimum of 60% recycled content and is 100% recyclable.

RECYCLED MATERIALS

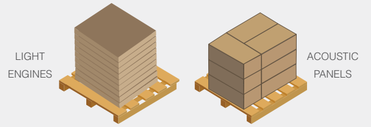
SUSTAINABLE

ECO FRIENDLY

SHIP THIS! (NOT THAT)

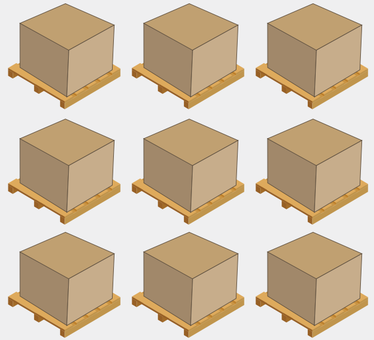
CASE STUDY: PALLET COMPARISON

The Shaper Sense products stack up well against the competition. The flat pack design allows more fixtures on to a pallet, and thus less pallets and environmental impacts for a project. The Shaper Sense Box, fixture for instance, can fit 9 complete products on to **two pallets**. The competition (assuming one large fixture per pallet), would need **nine individual pallets**.



9 Shaper Sense Box fixtures – fits on 2 pallets

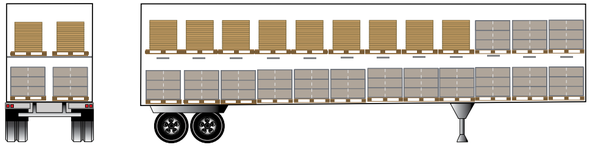
VS.



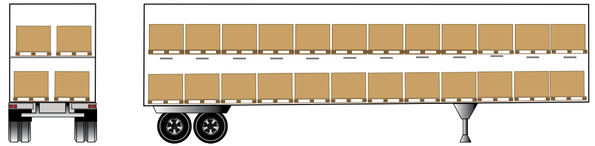
9 large scale acoustic lighting fixtures – fits on 9 pallets

CASE STUDY: TRUCK LOAD COMPARISON

SHAPER SENSE PRODUCTS - 270 BOX / 200 TRAP FIXTURES AT MAXIMUM CAPACITY

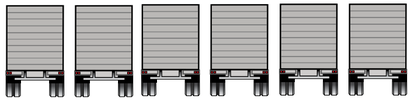


COMPETITOR X - 48 ACOUSTIC FIXTURES AT MAXIMUM CAPACITY



SHAPER SENSE (1) FULL TRUCK LOAD

COMPETITOR X (6) FULL TRUCK LOADS



ASSUMPTIONS

53 ft Semi-flat bed truck, 45"x48" pallet, 48 pallets fill full capacity in Semi-flatbed truck

Competitors X - 1 large fixture / pallet

Shaper Sense Box - 15 light engines/ pallet + 9 acoustic panels/ pallet, Shaper Sense Trap - 15 light engines/ pallet + 6 acoustic panels/ pallet

LIGHT WAVES + SOUND WAVES...

A REFLECTION

Sound waves and light waves act similarly. In LIGHTING, when light waves reflect on hard surfaces, like gypsum for example, they create a pleasing and diffused light. In SOUND, *"When sound reflects on hard surfaces, it causes overlapping reflections that are either experienced as echoes (distinct reflections that reduce intelligible speech), or build up as reverberation, which makes communication generally more difficult. When beautiful hard surface spaces are designed, sound absorption materials become difficult to incorporate."* - Scott Pfeiffer, Partner at Threshold Acoustics

The concept of adding acoustic materials on a light fixture provides an aesthetically pleasing way to provide sound absorption back into the space in increments that are beneficial to the spacing of lighting fixtures.

HOW SOUND REFLECTS...

- 100% sound absorption yields an NRC = 1.0

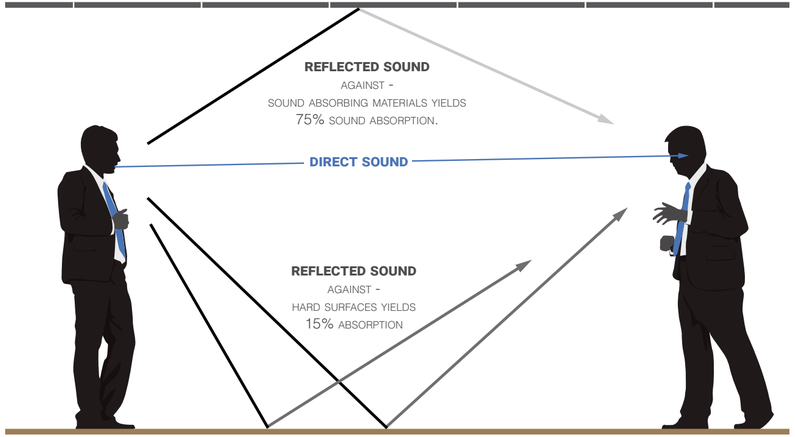
- 0% sound absorption yields an NRC = 0

This example shows a ceiling tile that has an NRC equal to 0.75, which means it stops 75% of the sound from going through. In the same way, when sound hits a hardwood floor, only 15% of the sound is absorbed, thus allowing 85% to reflect. This can cause multiple echoes of reflected sound, called reverberation, which can be uncomfortable. Using more sound absorption materials in a space can reduce reverberation.

Sound hits a surface, gets absorbed, then reflects the excess. If a surface does not absorb sound well, then sound continues to reflect, though eventually becoming 100% absorbed.

EXAMPLE OF NRC IN MATERIALS

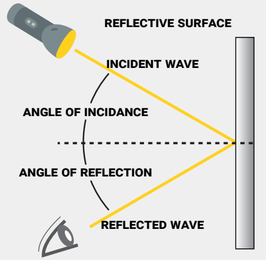
ACOUSTIC TILE CEILING - NRC = 0.75

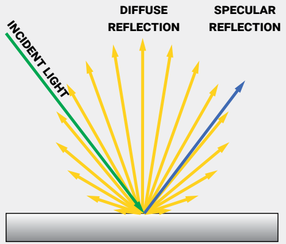


HARDWOOD FLOOR - NRC = 0.15

HOW LIGHT REFLECTS...

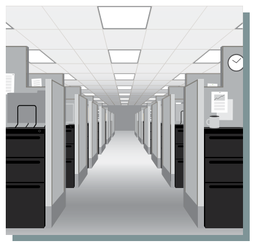
When light reflects, it either gets absorbed or reflects depending on the reflectance value of the surface it hits. In lighting, there is specular reflectance and diffuse reflectance. Specular reflectance takes the incident light and reflects back the same amount as a specular reflection. Diffuse reflectance sends the light uniformly in all directions regardless of the incident direction. This can create soft light, rather than poignant light reflection. In lighting, the reflectance through diffusion can create soft ambient lighting effects that are soothing.



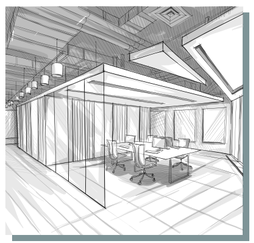


WHAT'S SO GREAT ABOUT SOUND ABSORBING LIGHT FIXTURES?

When new open office and space design evolved in taking down the cubicle walls and opening up the ceiling plane, the sound absorbing materials, often the acoustic ceiling tiles, went out the window as well. By adding sound absorption materials onto the light fixture, sound absoption materials can be added back into spaces in increments of a lighting layout.

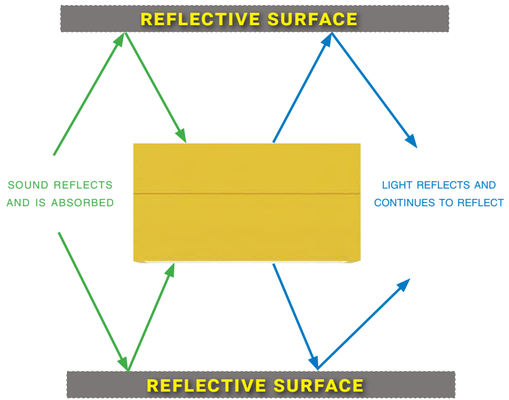


CLOSED OFF OFFICE DESIGN WITH ACOUSTIC TILE CEILING



THE OPEN OFFICE AND TAKING ACOUSTIC TILES OUT OF THE DESIGN

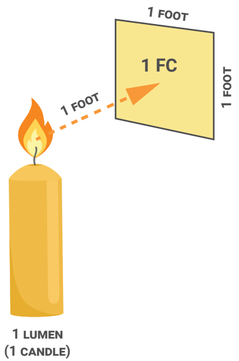
SOUND ABSORBING LUMINAIRE



LIGHTING 101

LIGHT:

Visible light is the portion of the **electro-magnetic spectrum** that is perceived by the **human** eye, and is responsible for the sense of **sight**.

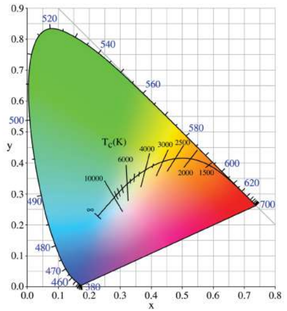


FOOTCANDLE (fc):

Noun: **footcandle**; plural noun: **footcandles** is the imperial unit of illumination, or lumen density incident on a surface. One footcandle is equal to 10.764 lux (SI units), and represents the illuminance cast on a surface by a one-candela (12.57 lumen) omnidirectional source one foot away.

LUMEN (lm):

The SI unit of luminous flux. One lumen is the amount of flux emitted into a unit solid angle (1 steradian) by a one-candela omnidirectional point source. Luminous flux (lumens) is radiant power (watts) multiplied by the luminous efficacy curve of the human eye. This accounts for our eyes perceiving different wavelengths with different sensitivities across the visible spectrum.



CCT: CORRELATED COLOR TEMPERATURE:

The correlated color temperature (CCT) of a light source is the temperature, in kelvin, to which an ideal blackbody radiator must be heated in order to emit light that resembles the chromaticity of the light source in question. As a blackbody radiator is heated, the chromaticity of the “white” light emitted changes from red-orange towards blue. The continuous curved line defining the color change over temperature is referred to as the Planckian locus.

The CIE 1931 x,y chromaticity space, also showing the chromaticities of black-body light sources of various temperatures (Planckian locus), and lines of constant correlated color temperature.

LIGHTING 101

CRI: COLOR RENDERING INDEX:

Color rending index (CRI) is a quantitative measure of the ability of a light source to reveal the colors of objects faithfully in comparison with daylight or incandescent reference illuminant. For example, imagine going to a grocery store and having apples look grayish-red, that would indicate that the lights in the store render some colors poorly and may have a low CRI. If you took that same apple outside it would look more natural.

Rf: Fidelity Index:

The fidelity index expands on the concepts of the CRI by introducing 99 new color samples for consideration across a more broad range of hues and saturations than CRI. This is a better overall indication of the lights ability to render colors accurately.

Rg: Gamut Index:

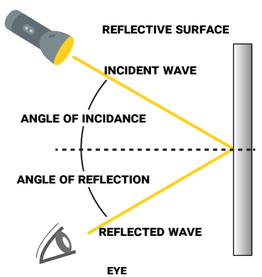
The gamut index indicates the change in saturation of colors. A gamut index of 100 indicates that, on average, the light source does not change the saturation of colors relative to the reference illuminant. If the Rg is less than 100, the light source renders colors as less saturated, and if it is higher than 100, then it renders colors more saturated. This value is averaging the effect of all colors considered, so the detailed TM-30 data should be referenced to understand the change in chroma across hues.

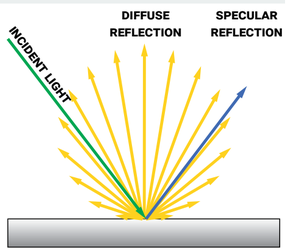
Example of fidelity and gamut values compared to test source.

Fidelity - Rf: 81
Gamut - Rg: 95.9

DIFFUSE LIGHTING AND REFLECTION:

Light reflects off of diffuse and specular surfaces. White surfaces are good for reflection as well as hard surfaces. When light reflects off of these, it continues and it dissipates. These multiple lighting reflections create diffuse lighting which creates soft inter-reflected light. This can be more comfortable than direct lighting which can be more intense and sometimes harsh.





SOUND - THE NEW LANGUAGE

The work place landscape and culture has shifted over the past number of years to adjust to changing demographics, technologies, and work styles that combine focused work as well as team work setting. This has lead to investigation of noise in the work place and productivity and better solutions to help with this problem. To understand the integrated lighting and acoustic products from Shaper Sense, a new language and terminology is being introduced and learned as well. Here are just some of the new functional vocabulary:

ABC's OF ACOUSTICS

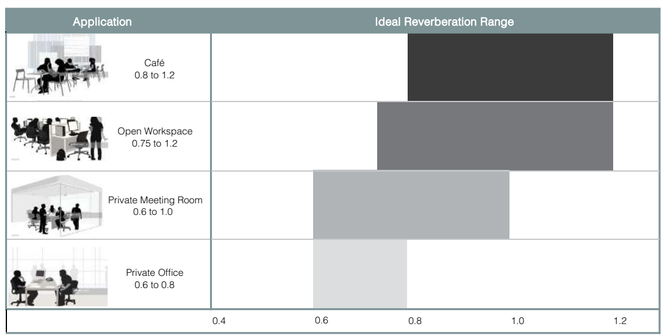
A ABSORB **B** BLOCK **C** COVERUP

These 3 techniques are the base line on acoustic design. Different materials and technologies can help account for the most beneficial acoustic soundscapes. Shaper Sense products currently focus on "A" – absorption – which directly affects Reverberation and RT.

REVERBERATION - sound that lingers due to reflection in an interior space

RT60 – REVERBERATION TIME - is the number of seconds required for the intensity of the sound to drop from the starting level, by an amount of 60 Db.

Table of common reverberation times based on application space. Ideal office space setting is between 0.6 and 0.8



Courtesy of FilzFelt

NRC - NOISE REDUCTION COEFFICIENT

Is a scalar representation of the amount of sound energy absorbed upon striking a particular surface.

SAA - SOUND ABSORPTION AVERAGE

This is the average of the absorption coefficients for the twelve one-third octave bands from 200 to 2500 Hz... The higher the SAA or the NRC value, the better the material absorbs sound

Examples of noise reduction properties within materials:

MATERIAL	NRC VALUES
Marble	0
Brick - Painted	0.02
Concrete (block), painted	0.05
Brick, unpainted	0.05
Concrete (smooth), painted	0.05
Steel	0.1
Glass	0.1
Wood	0.15
Plywood	0.15
Concrete (smooth), unpainted	0.2
Carpet, indoor-outdoor	0.2
Carpet, heavy on concrete	0.3
Concrete (block), unpainted	0.35
Carpet, heavy on foam rubber	0.55
Fiberglass, 1" Semi-rigid	0.75
Fiberglass, 3-1/2" batt	0.95
FilzFelt Acoustic Baffles	**1.2**
Shaper Sense Box	**1.2**
Shaper Sense Trapezoid	**1.4**

The Noise Reduction Coefficient (NRC) is the amount of sound absorbed when a sound wave strikes a surface. An NRC of zero indicates perfect reflection; and NRC of one indicates 100% sound absorption. Lighting Acoustic fixtures have taken on new shapes and geometries that the testing labs are not familiar with. Traditionally, NRC is calculated for flat materials. Because of this paradigm, and the request by the industry to state NRC, test labs have performed these tests on these geometries, which are yielding results higher than 1.0. Currently the test method is following ASTM 423C-17. NRC is the term most recognized and used by the architectural and building industy, but not recognized by ASTM. ASTM has moved to Sound Absorption Average, SAA, that covers more frequency bands within the framework of sound. The conversation around sound is really about reducing Reverberation Time in a space – to improve speech intelligibility.

NAME THAT SOUND: OTHER COMMONLY USED TERMS AND EXAMPLES:

dB - DECIBEL A unit used to measure the intensity of a sound.

Examples of decibels in every day life:

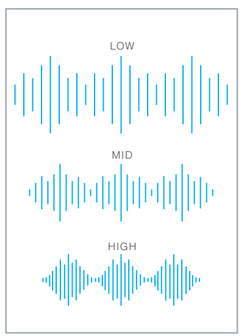
"DECIBEL, dB"	DESCRIPTION
0	a mosquito 10 ft away
13	ordinary light bulb hum
40	whisper
50	typical office noise level
40-60	normal conversation
80	heavy traffic at 10am
85	beginning of hearing damage, earplugs should be worn
110	night club - dance floor
116	human body perceiving low vibration
130-135	large train horn
150	rock concert
165	727 taking off
198-202	human death from sound
220	space shuttle landing
235	5.0 Richter scale earthquake
320	volcanic eruption

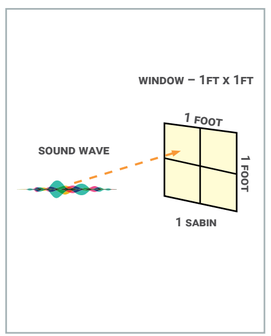
Fr - FREQUENCY The rate at which a vibration occurs that constitutes a wave, either in a material (as in sound waves), or in an electromagnetic field (as in radio waves and light), usually measured per second.

Hz - HERTZ The SI unit of frequency, equal to one cycle per second.

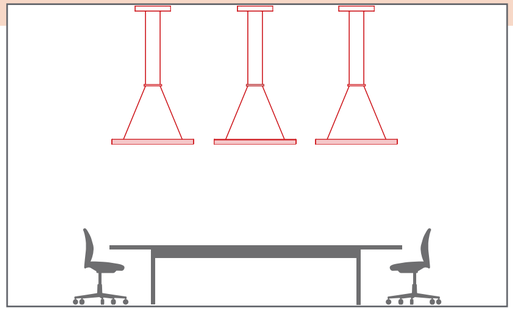
SB - SABIN Unit of sound absorption (the process by which a material, structure or object takes in sound energy, as opposed to reflecting or transmitting the energy). One sabin indicates the equivalent absorption of one square foot (or square meter in SI units) of a perfect 100% sound absorber.

EX. TEST REPORT : SPECIMEN ABSORPTION		
FREQUENCY [HZ]	SABINS	SABIN/UNIT
315	45.89	15.30
400	52.77	17.59
500	70.77	23.59
630	78.65	26.22
800	86.33	28.78
1000	91.79	30.60
1250	95.97	31.99
1600	97.55	32.52
2000	95.34	31.78
2500	94.56	31.52
3150	91.80	30.60

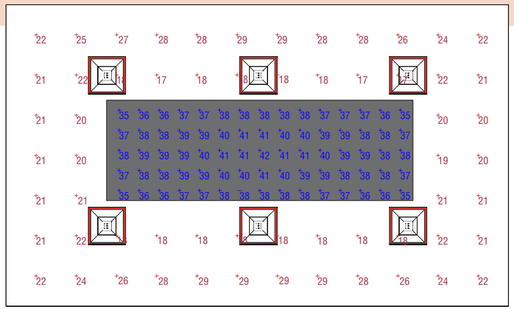


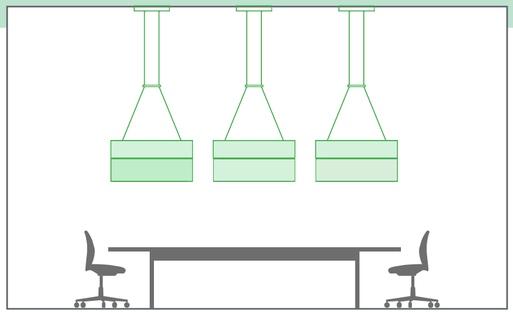


EXAMPLES OF FREQUENCY BANDS OF HUMAN SPEECH. AS A COMMON SOUND SOURCE, IF THESE BANDS OF CAN BE ABSORBED, THE REFLECTED SOUND THAT MAKES A SPACE UNCOMFORTABLE CAN BE REDUCED.



LIGHT FIXTURE WITHOUT SOUND ABSORBING MATERIALS

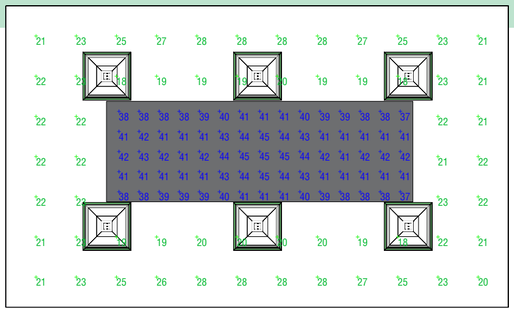




LIGHT FIXTURE WITH SOUND ABSORBING MATERIALS

NRC = 1.2

SAA = 1.19



Ambient lighting calculations performed on the floor and table (2.5 AFF). Ratios remain comfortable relative to task and ambient light levels.

LIGHTING CALCULATION STATISTICS

DESCRIPTION	SYMBOL	AVG	MAX	MIN	MAX/MIN	AVG/MIN
SQUARE CALCS @ TABLE	+	40 fc	43 fc	35 fc	1.2 : 1	1.1 : 1
SQUARE CALCS @ FLOOR	+	25 fc	29 fc	17 fc	1.7 : 1	1.5 : 1
BOX CALCS @ TABLE	+	41 fc	45 fc	37 fc	1.2 : 1	1.1 : 1
BOX CALCS @ FLOOR	+	23 fc	28 fc	18 fc	1.6 : 1	1.3 : 1

RT60 : LIGHT FIXTURES WITHOUT ACOUSTIC SOUND ABSORPTION

FREQUENCY (Hz)						AVG
125	250	500	1000	2000	4000	250-2k
0.76	0.97	1.15	1.11	0.91	0.85	1.04

These frequencies are represented in octave bands that are related to human speech. The results are the RT60 for each frequency in seconds. In this calculation, it is without sound absorbers around the light engines.

RT60 : LIGHT FIXTURES WITH ACOUSTIC SOUND ABSORPTION

FREQUENCY (Hz)						AVG
125	250	500	1000	2000	4000	250-2k
0.67	0.82	0.84	0.74	0.64	0.62	0.76

These frequencies are represented in octave bands that are related to human speech. The results are the RT60 for each frequency in seconds. In this calculation, the light fixtures include sound absorbers around the light engines in a box shape configuration and uniform layout.

% IMPROVEMENT IN REVERBERATION (RT60)

FREQUENCY (Hz)						AVG
125	250	500	1000	2000	4000	250-2k
12%	16%	27%	33%	30%	27%	27%

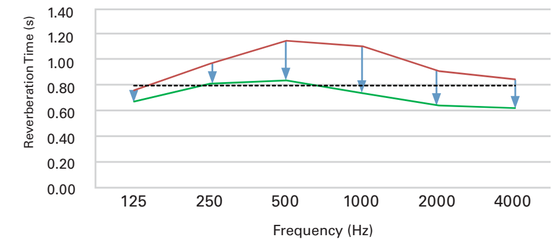
EX. 58% REVERBERATION DECREASE (RT60) USING 6 SHAPER SENSE BOX FIXTURES AT 8.5 FT SPACING.

The percentages represent the % improvement in reverberation per octave band, and then an average value over the entire range. It is recommended to use between 0.6 to 0.8 as an Reverberation Time goal for office settings.

LIGHTS, SOUND, CALC!

BOX

Lighting calculations and the effect on placement of the product relative to sound absorption are shown here. Sound testing labs compute a Sabin/ unit report that produces a value corresponding to a frequency band. This frequency range is put into the perspective of human speech octave, and how we measure reverberation. Here we show those values in a typical conference room, with and without acoustic substrate surrounds. The layout can be similar to how we lay out lighting to get uniform distributions as well as effective sound absorption, or lower reverberation.

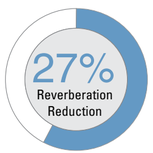


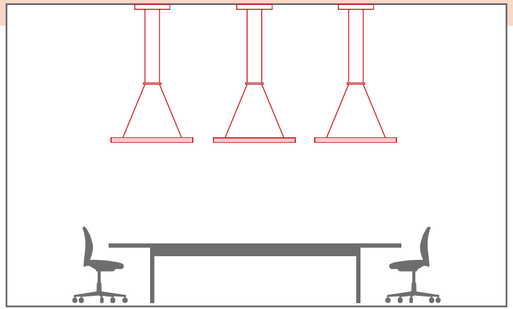
RT60 (without acoustic treatment)

RT60 (with acoustic treatment)

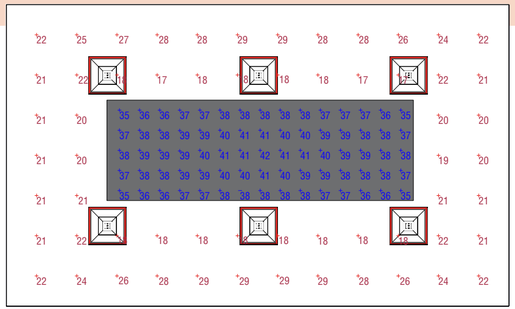
GOAL

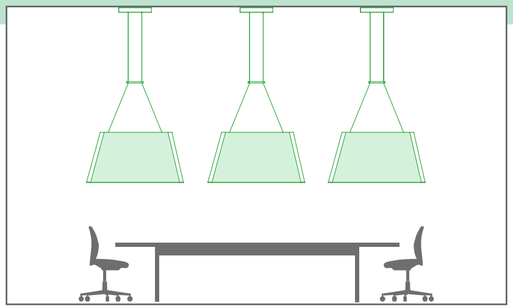
RT60 GOAL (typical. office) 0.8





LIGHT FIXTURE WITHOUT SOUND ABSORBING MATERIALS

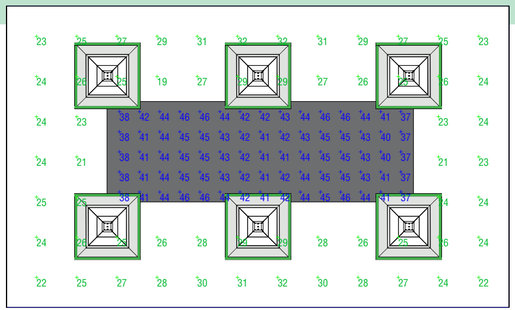




LIGHT FIXTURE WITH SOUND ABSORBING MATERIALS

NRC = 1.4

SAA = 1.38



Ambient lighting calculations performed on the floor and table (2.5 AFF). Ratios remain comfortable relative to task and ambient light levels.

LIGHTING CALCULATION STATISTICS

DESCRIPTION	SYMBOL	AVG	MAX	MIN	MAX/MIN	AVG/MIN
SQUARE CALCS @ TABLE	+	40 fc	43 fc	35 fc	1.2 : 1	1.1 : 1
SQUARE CALCS @ FLOOR	+	25 fc	29 fc	17 fc	1.7 : 1	1.5 : 1
TRAP CALCS @ TABLE	+	43 fc	46 fc	37 fc	1.2 : 1	1.2 : 1
TRAP CALCS @ FLOOR	+	26 fc	32 fc	21 fc	1.5 : 1	1.2 : 1

RT60 : LIGHT FIXTURES WITHOUT ACOUSTIC SOUND ABSORPTION

FREQUENCY (Hz)						AVG
125	250	500	1000	2000	4000	250-2k
0.76	0.97	1.15	1.11	0.91	0.85	1.04

These frequencies are represented in octave bands that are related to human speech. The results are the RT60 for each frequency in seconds. In this calculation, it is without sound absorbers around the light engines.

RT60 : LIGHT FIXTURES WITH ACOUSTIC SOUND ABSORPTION

FREQUENCY (Hz)						AVG
125	250	500	1000	2000	4000	250-2k
0.64	0.75	0.68	0.60	0.53	0.52	0.64

These frequencies are represented in octave bands that are related to human speech. The results are the RT60 for each frequency in seconds. In this calculation, the light fixtures include sound absorbers around the light engines in a Trapezoid shape.

% IMPROVEMENT IN REVERBERATION (RT60)

FREQUENCY (Hz)						AVG
125	250	500	1000	2000	4000	250-2k
16%	23%	41%	46%	42%	39%	38%

EX. 38% REVERBERATION DECREASE (RT60) USING 6 SHAPER SENSE TRAPEZOID FIXTURES.

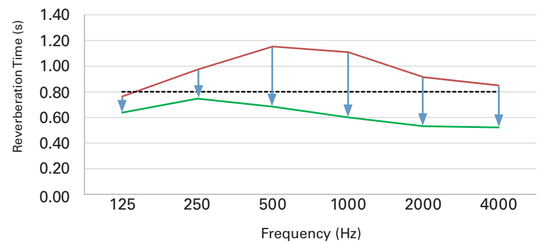
The percentages represent the % improvement in reverberation per octave band, and then an average value over the entire range. It is recommended to use between 0.6 to 0.8 as an Reverberation Time goal for office settings.

LIGHTS, SOUND, CALC!

TRAPEZOID

Lighting calculations and the effect on placement of the product relative to sound absorption are shown here. Sound testing labs produce a Sabin/ unit report that produces a value corresponding to a frequency band. This frequency range is put into the perspective of human speech octave, and we measure reverberation. Here we show those values in a typical conference room, with and without acoustic substrate surrounds. The layout can be similar to how we lay out lighting to get uniform distributions as well as effective sound absorption, or lower reverberation.

Reverberation Time (RT60)

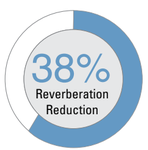


RT60 (without acoustic treatment)

RT60 (with acoustic treatment)

GOAL

RT60 GOAL (typical. office) 0.8



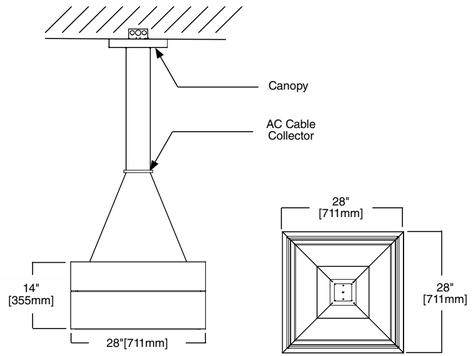
TECHNICAL SPECIFICATIONS

BOX

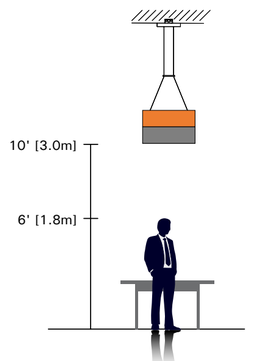
Felt Color Selections for Top and Bottom Panels

487 Pfirsich	023 Koralle	945 Drachenfrucht	221 Himbeere	136 Weinrot	209 Bordeaux	102 Kirsche	201 Rot	125 Tomate	179 Hellrot
180 Terracotta	173 Mango	105 Rost	573 Kupfer	116 Orange	495 Abricot	124 Gelb	131 Honig	509 Kamel	550 Ocker
274 Senf	108 Zitrone	403 Mais	535 Sesam	203 Vanille	027 Kartause	384 Lind	713 Kiwi	377 Maigrün	732 Farn
378 Oliv	260 Sprießen	156 Loden	343 D'Grün	435 Smaragd	625 Pinie	248 Jade	472 Minze	575 Salbei	483 Adria
548 Türkis	312 Lagune	345 Pazifik	308 Petrol	698 Dunst	405 Stahl	215 Meer	540 Ozean	533 Indigo	282 D'Blau
111 Traube	626 Azur	647 Kobalt	686 Enzian	272 Royal	286 H'Blau	995 Wasser	458 Bekwölkt	284 Himmel	613 Gletscher
551 Eis	113 Immergrün	099 Lila	667 Amethyst	242 Pink	640 Granat	634 Erröten	671 Pfingstrose	255 Flieder	269 Violett
437 Aubergine	250 Trüffelbraun	220 Rehbraun	411 Alpaka	190 Natur-meliert	200 Natur	331 Sahara	311 Mandel	467 Sand	481 Sandstein
100 Wollweiss	110 Rohweiss	160 Beige	529 Champagner	150 Weiss	428 Silber	427 Stein	021 Beton	170 Asche	423 Hellgrau
408 Taupe	175 Graphit	425 Taubengrau	446 Kohle	300 Anthrazit	426 Schwarz				

Dimensions



Scale



Series
ShSh = Shaper Sense

Shape/Family
BOX=Box

Light Level[1]
1-L30-90=2480 lumens, 30W, 3000K, 90 CRI
1-L35-80=3084 lumens, 30W, 3500K, 80 CRI
1-L40-80=3028 lumens, 30W, 4000K, 80 CRI
2-L30-90=3172 lumens, 39W, 3000K, 90 CRI
2-L35-80=3944 lumens, 39W, 3500K, 80 CRI
2-L40-80=3873 lumens, 39W, 4000K, 80 CRI

v

Mounting
CNPY = Canopy mount (works for surface, open structure, and gypsum ceilings

Dimming
STD = 0-10V

Controls
SWTPD1 = Wavelinx Wireless Tile
LWTPD1 = LumaWatt Pro Wireless Tile

Voltage
UNV - 120 - 277V

Finish

Top Panel Selection (TP)[2]

TP487=Pfirsich
TP023=Koralle
TP945=Drachenfrucht
TP221=Himbeere
TP136=Weinrot
TP209=Bordeaux
TP102=Kirsche
TP201=Rot
TP125=Tomate
TP179=Hellrot
TP180=Terracotta
TP173=Mango
TP105=Rost
TP573=Kupfer
TP116=Orange
TP495=Abricot
TP124=Gelb
TP131=Honig
TP509=Kamel
TP550=Ocker
TP274=Senf
TP108=Zitrone
TP403=Mais
TP535=Sesam
TP203=Vanille
TP027=Kartause
TP384=Lind
TP713=Kiwi
TP377=Maigrün
TP732=Farn
TP378=Oliv
TP260=Sprießen
TP156=Loden
TP343=D'Grün
TP435=Smaragd
TP625=Pinie
TP248=Jade
TP472=Minze
TP575=Salbei
TP483=Adria
TP548=Türkis
TP312=Lagune
TP345=Pazifik
TP308=Petrol
TP698=Dunst
TP405=Stahl
TP215=Meer
TP540=Ozean
TP533=Indigo
TP282=D'Blau
TP111=Traube
TP626=Azur
TP647=Kobalt
TP686=Enzian
TP272=Royal
TP286=H'Blau
TP995=Wasser
TP458=Bekwölkt
TP284=Himmel
TP613=Gletscher
TP551=Eis
TP113=Immergrün
TP099=Lila
TP667=Amethyst
TP242=Pink
TP640=Granat
TP634=Erröten
TP671=Pfingstrose
TP255=Flieder
TP269=Violett
TP437=Aubergine
TP250=Trüffelbraun
TP220=Rehbraun
TP411=Alpaka
TP190=Natur-meliert
TP200=Natur
TP331=Sahara
TP311=Mandel
TP467=Sand
TP481=Sandstein
TP100=Wollweiss
TP110=Rohweiss
TP160=Beige
TP529=Champagner
TP150=Weiss
TP428=Silber
TP427=Stein
TP021=Beton
TP170=Asche
TP423=Hellgrau
TP408=Taupe
TP175=Graphit
TP425=Taubengrau
TP446=Kohle
TP300=Anthrazit
TP426=Schwarz

Bottom Panel Selection (BP)[3]

BP487=Pfirsich
BP023=Koralle
BP945=Drachenfrucht
BP221=Himbeere
BP136=Weinrot
BP209=Bordeaux
BP102=Kirsche
BP201=Rot
BP125=Tomate
BP179=Hellrot
BP180=Terracotta
BP173=Mango
BP105=Rost
BP573=Kupfer
BP116=Orange
BP495=Abricot
BP124=Gelb
BP131=Honig
BP509=Kamel
BP550=Ocker
BP274=Senf
BP108=Zitrone
BP403=Mais
BP535=Sesam
BP203=Vanille
BP027=Kartause
BP384=Lind
BP713=Kiwi
BP377=Maigrün
BP732=Farn
BP378=Oliv
BP260=Sprießen
BP156=Loden
BP343=D'Grün
BP435=Smaragd
BP625=Pinie
BP248=Jade
BP472=Minze
BP575=Salbei
BP483=Adria
BP548=Türkis
BP312=Lagune
BP345=Pazifik
BP308=Petrol
BP698=Dunst
BP405=Stahl
BP215=Meer
BP540=Ozean
BP533=Indigo
BP282=D'Blau
BP111=Traube
BP626=Azur
BP647=Kobalt
BP686=Enzian
BP272=Royal
BP286=H'Blau
BP995=Wasser
BP458=Bekwölkt
BP284=Himmel
BP613=Gletscher
BP551=Eis
BP113=Immergrün
BP099=Lila
BP667=Amethyst
BP242=Pink
BP640=Granat
BP634=Erröten
BP671=Pfingstrose
BP255=Flieder
BP269=Violett
BP437=Aubergine
BP250=Trüffelbraun
BP220=Rehbraun
BP411=Alpaka
BP190=Natur-meliert
BP200=Natur
BP331=Sahara
BP311=Mandel
BP467=Sand
BP481=Sandstein
BP100=Wollweiss
BP110=Rohweiss
BP160=Beige
BP529=Champagner
BP150=Weiss
BP428=Silber
BP427=Stein
BP021=Beton
BP170=Asche
BP423=Hellgrau
BP408=Taupe
BP175=Graphit
BP425=Taubengrau
BP446=Kohle
BP300=Anthrazit
BP426=Schwarz

Notes: **1**. 3000K – only in 90 CRI, 3500K only available in 80 CRI,4000K only available in 80 CRI.
2. Selection for BOX top panel color. See diagram on page 3 for clarification.
3. Selection for BOX bottom panel color. See diagram on page 3 for clarification.

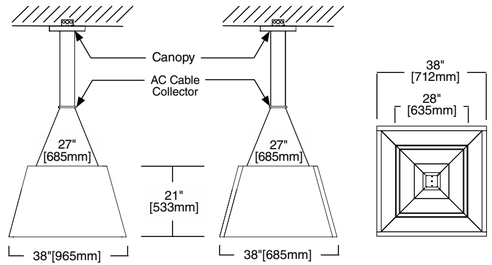
TECHNICAL SPECIFICATIONS

TRAPEZOID

Felt Color Selections for Side AA and Side BB Panels

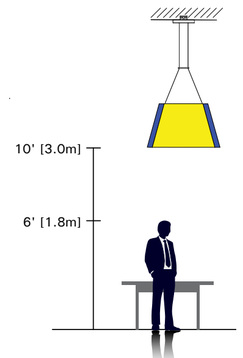
487 Pfirsich	023 Koralle	945 Drachenfrucht	221 Himbeere	136 Weinrot	209 Bordeaux	102 Kirsche	201 Rot	125 Tomate	179 Hellrot
180 Terracotta	173 Mango	105 Rost	573 Kupfer	116 Orange	495 Abricot	124 Gelb	131 Honig	509 Kamel	550 Ocker
274 Senf	108 Zitrone	403 Mais	535 Sesam	203 Vanille	027 Kartause	384 Lind	713 Kiwi	377 Maigrün	732 Farn
378 Oliv	260 Spießen	156 Loden	343 D'Grün	435 Smaragd	625 Pinie	248 Jade	472 Minze	575 Salbei	483 Adria
548 Türkis	312 Lagune	345 Pazifik	308 Petrol	698 Dunst	405 Stahl	215 Meer	540 Ozean	533 Indigo	282 D'Blau
111 Traube	626 Azur	647 Kobalt	686 Enzian	272 Royal	286 H'Blau	995 Wasser	458 Bekwölkt	284 Himmel	613 Gletscher
551 Eis	113 Immergrün	099 Lila	667 Amethyst	242 Pink	640 Granat	634 Erröten	671 Pfingstrose	255 Flieder	269 Violett
437 Aubergine	250 Trüffelbraun	220 Rehbraun	411 Alpaka	190 Natur-meliert	200 Natur	331 Sahara	311 Mandel	467 Sand	481 Sandstein
100 Wollweiss	110 Rohweiss	160 Beige	529 Champagner	150 Weiss	428 Silber	427 Stein	021 Beton	170 Asche	423 Hellgrau
408 Taupe	175 Graphit	425 Taubengrau	446 Kohle	300 Anthrazit	426 Schwarz				

Dimensions



Mono-tone Side View **Two-tone Side View** **Bottom View**

Scale



Series
ShSh = Shaper Sense

Shape/Family
TRAP=Trapezoid

Light Level[1]
1-L30-90=2487 lumens, 30W, 3000K, 90 CRI
1-L35-80=3092 lumens, 30W, 3500K, 80 CRI
1-L40-80=3036 lumens, 30W, 4000K, 80 CRI
2-L30-90=3181 lumens, 39W, 3000K, 90 CRI
2-L35-80=3955 lumens, 39W, 3500K, 80 CRI
2-L40-80=3884 lumens, 39W, 4000K, 80 CRI

Voltage
UNV = Universal Voltage (120-277)

Mounting
CNPY = Canopy mount (works for surface, open structure, and gypsum ceilings)

Dimming
STD = 0-10V

Controls
SWTPD1 = Wavelinx Wireless Tile
LWTPD1 = LumaWatt Pro Wireless Tile

Voltage
UNV - 120 - 277V

Finish

Mono-tone Side Panel[2] (AA)

AA487=Pfirsich
AA023=Koralle
AA945=Drachenfrucht
AA221=Himbeere
AA136=Weinrot
AA209=Bordeaux
AA102=Kirsche
AA201=Rot
AA125=Tomate
AA179=Hellrot
AA180=Terracotta
AA173=Mango
AA105=Rost
AA573=Kupfer
AA116=Orange
AA495=Abricot
AA124=Gelb
AA131=Honig
AA509=Kamel
AA550=Ocker
AA274=Senf
AA108=Zitrone
AA403=Mais
AA535=Sesam
AA203=Vanille
AA027=Kartause
AA384=Lind
AA713=Kiwi
AA377=Maigrün
AA732=Farn
AA378=Oliv
AA260=Spießen
AA156=Loden
AA343=D'Grün
AA435=Smaragd
AA625=Pinie
AA248=Jade
AA472=Minze
AA575=Salbei
AA483=Adria
AA548=Türkis
AA312=Lagune
AA345=Pazifik
AA308=Petrol
AA698=Dunst
AA405=Stahl
AA215=Meer
AA540=Ozean
AA533=Indigo
AA282=D'Blau
AA111=Traube
AA626=Azur
AA647=Kobalt
AA686=Enzian
AA272=Royal
AA286=H'Blau
AA995=Wasser
AA458=Bekwölkt
AA284=Himmel
AA613=Gletscher
AA551=Eis
AA113=Immergrün
AA099=Lila
AA667=Amethyst
AA242=Pink
AA640=Granat
AA634=Erröten
AA671=Pfingstrose
AA255=Flieder
AA269=Violett
AA437=Aubergine
AA250=Trüffelbraun
AA220=Rehbraun
AA411=Alpaka
AA190=Natur-meliert
AA200=Natur
AA331=Sahara
AA311=Mandel
AA467=Sand
AA481=Sandstein
AA100=Wollweiss
AA110=Rohweiss
AA160=Beige
AA529=Champagner
AA150=Weiss
AA428=Silber
AA427=Stein
AA021=Beton
AA170=Asche
AA423=Hellgrau
AA408=Taupe
AA175=Graphit
AA425=Taubengrau
AA446=Kohle
AA300=Anthrazit
AA426=Schwarz

Two-tone Side Panel[3] (BB)

BB487=Pfirsich
BB023=Koralle
BB945=Drachenfrucht
BB221=Himbeere
BB136=Weinrot
BB209=Bordeaux
BB102=Kirsche
BB201=Rot
BB125=Tomate
BB179=Hellrot
BB180=Terracotta
BB173=Mango
BB105=Rost
BB573=Kupfer
BB116=Orange
BB495=Abricot
BB124=Gelb
BB131=Honig
BB509=Kamel
BB550=Ocker
BB274=Senf
BB108=Zitrone
BB403=Mais
BB535=Sesam
BB203=Vanille
BB027=Kartause
BB384=Lind
BB713=Kiwi
BB377=Maigrün
BB732=Farn
BB378=Oliv
BB260=Spießen
BB156=Loden
BB343=D'Grün
BB435=Smaragd
BB625=Pinie
BB248=Jade
BB472=Minze
BB575=Salbei
BB483=Adria
BB548=Türkis
BB312=Lagune
BB345=Pazifik
BB308=Petrol
BB698=Dunst
BB405=Stahl
BB215=Meer
BB540=Ozean
BB533=Indigo
BB282=D'Blau
BB111=Traube
BB626=Azur
BB647=Kobalt
BB686=Enzian
BB272=Royal
BB286=H'Blau
BB995=Wasser
BB458=Bekwölkt
BB284=Himmel
BB613=Gletscher
BB551=Eis
BB113=Immergrün
BB099=Lila
BB667=Amethyst
BB242=Pink
BB640=Granat
BB634=Erröten
BB671=Pfingstrose
BB255=Flieder
BB269=Violett
BB437=Aubergine
BB250=Trüffelbraun
BB220=Rehbraun
BB411=Alpaka
BB190=Natur-meliert
BB200=Natur
BB331=Sahara
BB311=Mandel
BB467=Sand
BB481=Sandstein
BB100=Wollweiss
BB110=Rohweiss
BB160=Beige
BB529=Champagner
BB150=Weiss
BB428=Silber
BB427=Stein
BB021=Beton
BB170=Asche
BB423=Hellgrau
BB408=Taupe
BB175=Graphit
BB425=Taubengrau
BB446=Kohle
BB300=Anthrazit
BB426=Schwarz

Notes: **1**. 3000K – only in 90 CRI, 3500K only available in 80 CRI,4000K only available in 80 CRI.
2. Selection for TRAP Mono-Tone color side panel. See diagram on page 3 for clarification.
3. Selection for TRAP Two-Tone color side panel. See diagram on page 3 for clarification.

Lighting Product Lines

Ametrix
AtLite
Corelite
Ephesus
Fail-Safe
Halo
Halo Commercial
Invue
io
Iris
Lumark
Lumière
McGraw-Edison
Metalux
MWS
Neo-Ray
Portfolio
RSA
Shaper
Streetworks
Sure-Lites

Controls Product Lines

Fifth Light Technology
Greengate
iLight (International Only)
iLumin
Zero 88

Connected Lighting Systems

Distributed Low-Voltage Power
HALO Home
iLumin Plus
LumaWatt Pro
WaveLinx
Trellix

COOPER Lighting Solutions

Cooper Lighting Solutions
1121 Highway 74 South
Peachtree City, GA 30269
P: 770-486-4800
cooperlighting.com

Canada Sales
5925 McLaughlin Road
Mississauga, Ontario L5R 1B8
P: 905-501-3000
F: 905-501-3172

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