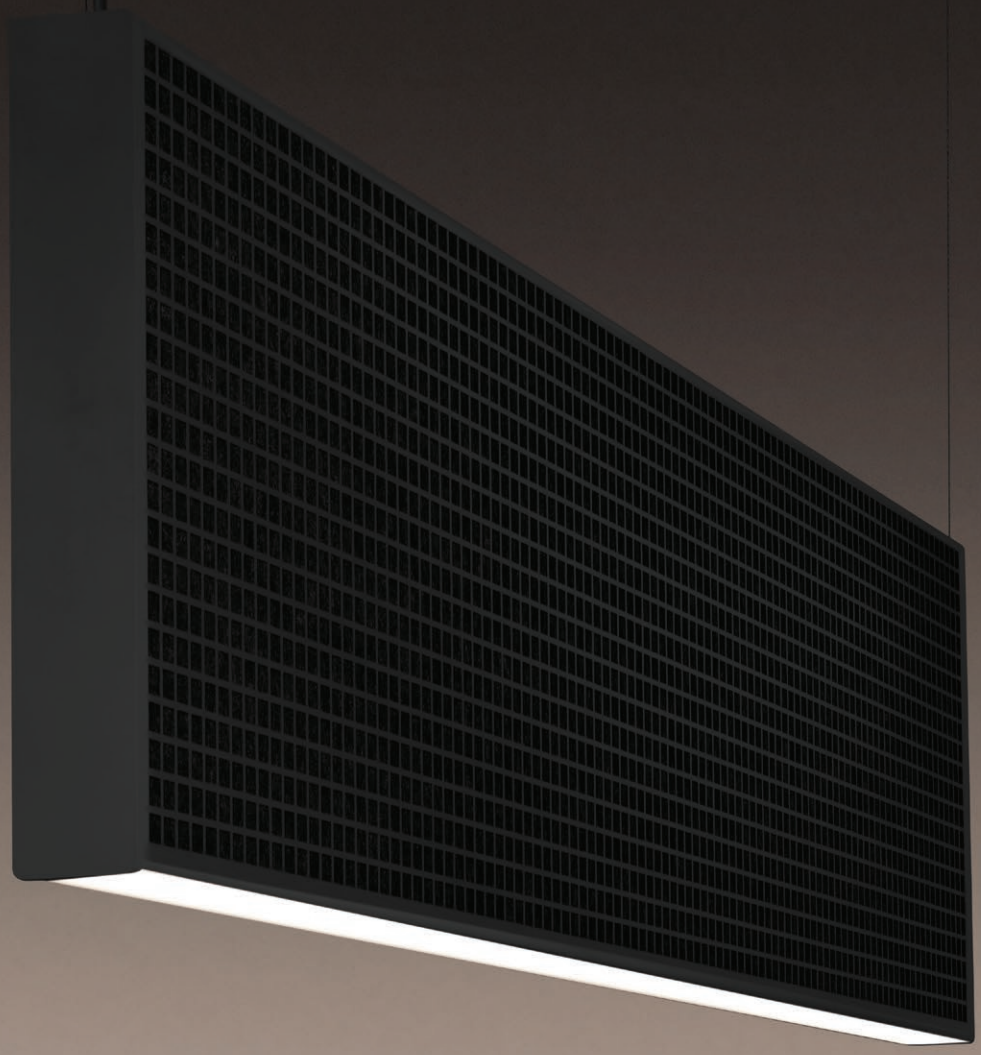
acoustix

Innovation in acoustic lighting



reddot winner 2020

Patent pending EchoCore™ technology

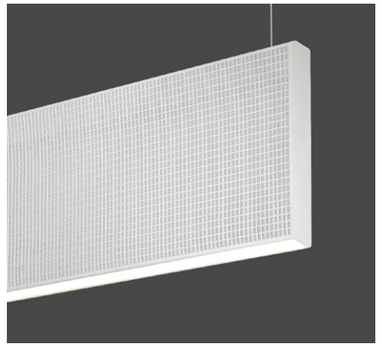
LUMENWERX

Introducing Acoustix

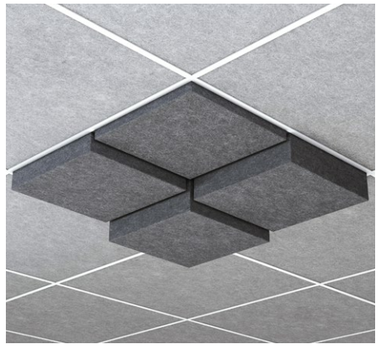
Thanks to open concept architecture and multi-use design, today's indoor spaces are much noisier than those of previous generations. To cut down on rising levels of clamour, Lumenwerx proudly introduces the ACOUSTIX family, luminaires with integrated sound absorbing technology.

Uncompromised illumination with excellent sound absorption

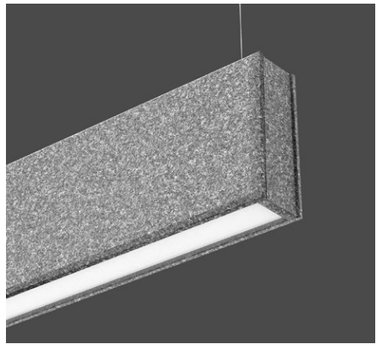
- Two sound absorption technologies
- Easy to use acoustic performance calculator
- White, Tunable White, RGB+W and Biologically optimized spectrum with Bios LED
- Multiple Control Solutions



AUDIA ECHOCORE™

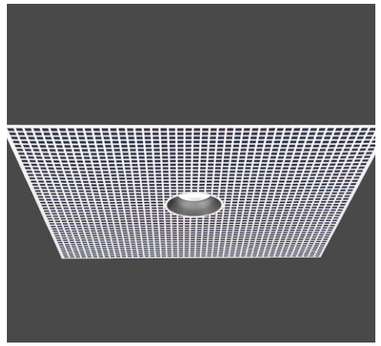


POP RECESSED ACOUSTIX

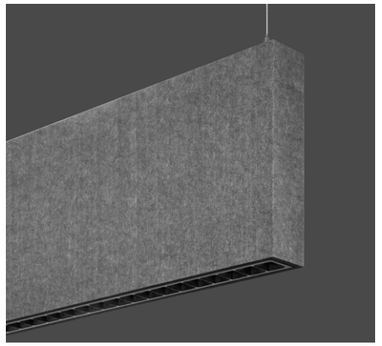


VIA 2 ACOUSTIX

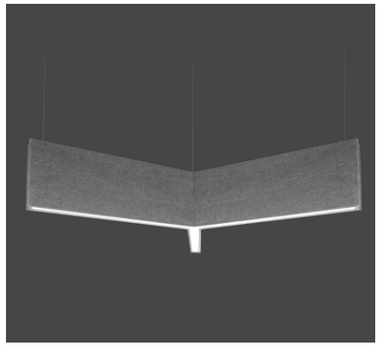
RIM VERSO ACOUSTIX



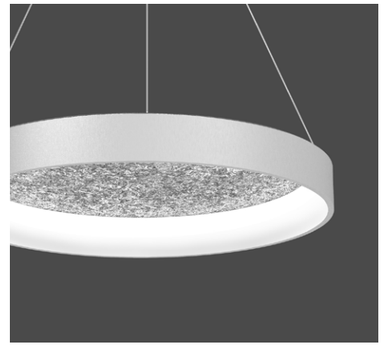
AERA 4" ECHOCORE™



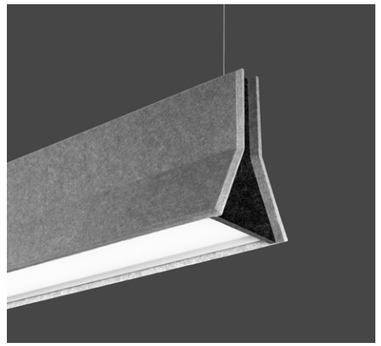
SQUERO ACOUSTIX



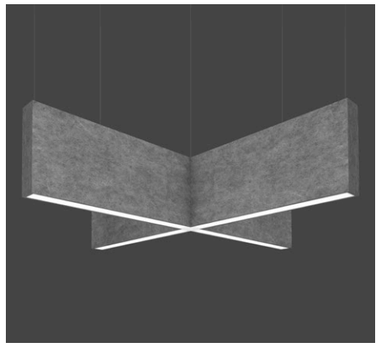
VIA 1.5-2 SPOKE ACOUSTIX



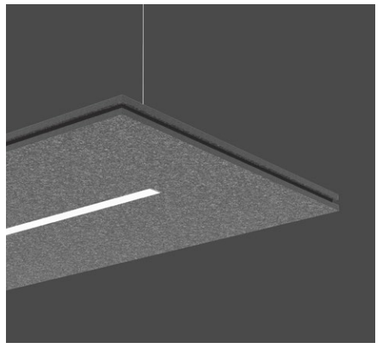
TOGO ACOUSTIX



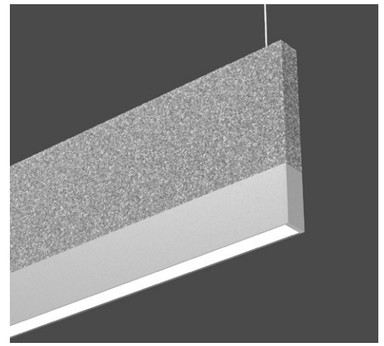
ARRO 4 ACOUSTIX



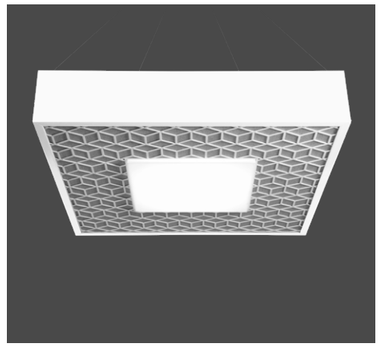
SQUERO SPOKE ACOUSTIX



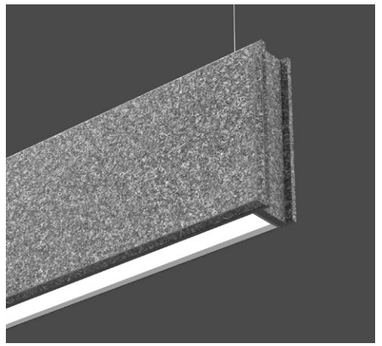
MIKRO WAFER



VIA STIL



POP ECHOCORE™



VIA 1.5 ACOUSTIX

CLUSTER ACOUSTIX P. 12

Acoustic challenges

Wide open spaces and spare lines are the defining elements of many architecturally advanced environments. Features like polished concrete floors, vaulted ceilings and open ductwork all contribute to spaces that are aesthetically inviting, but come with a critical unintended consequence – excess noise.

Glass - The amount of glass in a space is increasing due to daylight requirements and the modern design of natural light in our built environment. Glass is a very hard smooth surface with a poor absorption rate that creates issues as it bounces sound around.

Open Office - Traditionally office space was largely divided between private office space and cubicles. This has been replaced by today's open office concept. In open office space, noise increases and the need for acoustic strategies is a must.

Unfinished Ceilings - Pose a separate set of challenges; often having visible duct work exposed along with ambient noise caused by their systems. Water, conduits and data raceways are exposed as well resulting in increased clamour.

Hard reflecting surfaces - Metals, concretes, glass, brick, stone and tile all contribute to poor acoustical comfort of a space. Hard surfaces are usually clean but they tend to act poorly when it comes to sound absorption.

Visual language of the open office.

Increase use of Glass

Open Office Concept

Unfinished Ceilings

Hard Reflecting Surfaces

How do acoustics works?

Crafting the ideal solution

While in the past, sound was absorbed with carpet, wall hangings and ceiling grids, today's minimalist spaces need an architecturally integrated solution.

USEFUL GLOSSARY OF TERMS

Sabin - a unit of sound absorption, equal to one square foot of a perfectly absorptive surface

Hertz- (abbreviated: Hz) is the standard unit of measurement used for measuring frequency. Since frequency is measured in cycles per second, one hertz equals one cycle per second. Hertz is commonly used to measure wave frequencies, such as sound waves, light waves, and radio waves.

NRC - The Noise Reduction Coefficient (NRC) is a scalar representation of the amount of sound energy absorbed after that energy strikes a particular surface. An NRC of zero indicates a perfect reflection of the sound energy, and an NRC of one indicates a perfect absorption of it.

Frequency - the number of cycles or completed alternations per unit time of a wave or oscillations.

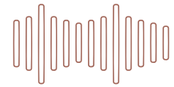
Decibel - a unit used to measure the intensity of a sound or the power level of an electrical signal by comparing it with a given level on a logarithmic scale.

Reverb - is a shaking or echoing effect that is added to a sound

Reverberation Time - is a measure of the time required for the sound to "fade away" in an enclosed area after the source of the sound has stopped.

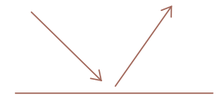
CHALLENGE:
SOUND

In unobstructed open space, sound travels at 1000 ft/second. In a 50" x 20" room, that sound might bounce off hard surfaces up to 60 times before dying out.



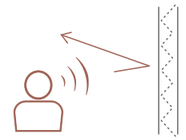
SOLUTION:
REDIRECTING SOUND

By redirecting sound we can reduce the speed that sound travels. When sound hits a barrier and bounces, reverberation time, or echo, is reduced.



CHALLENGE:
ECHO (REVERBERATION TIME)

"Reverberation" is delayed sound caused by prolonged refraction. Excess reverberation creates noise issues in the built environment, and can reduce the comprehension of speech.



SOLUTION:
SOUND ABSORPTION

By using acoustical absorbing materials and sound trapping strategies such as the Helmholtz resonance principal, we can create areas to trap the sound. This can be done using wall coverings and carpets but given the desire for clean sleek minimal spaces it makes sense to deploy an acoustical system incorporating the lit environment of the space.

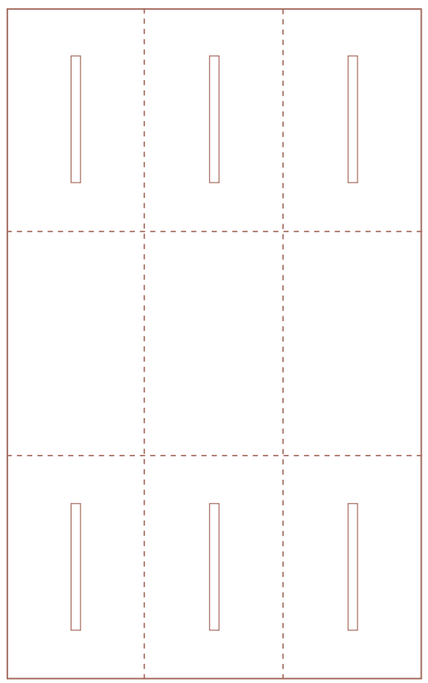
How to improve acoustics in a room?

Similar to lighting design, we approach acoustical design using the same principles. We want to create layers of sound absorption - one system offers an improvement but two or even three acoustic systems will show a decrease in reverberation time and reduction in unwanted noise. Humans can notice acoustical improvement of 0.2 seconds of reverberation time. We have incorporated this in our Good, Better and Best acoustic values calculations.

☺ Good: Reverberation time is reduced by 25%
☺ ☺ Better: Reverberation time is reduced by 40%
☺ ☺ ☺ Best: Reverberation time is reduced by 50%

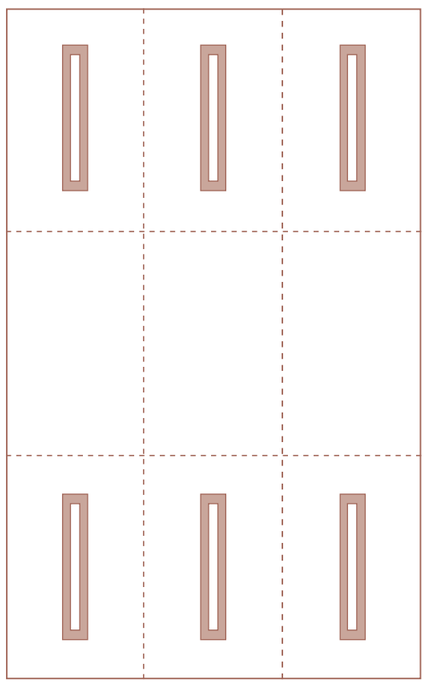
☺ General lighting
☹ No acoustic

0%	1.3 s	Reverberation time



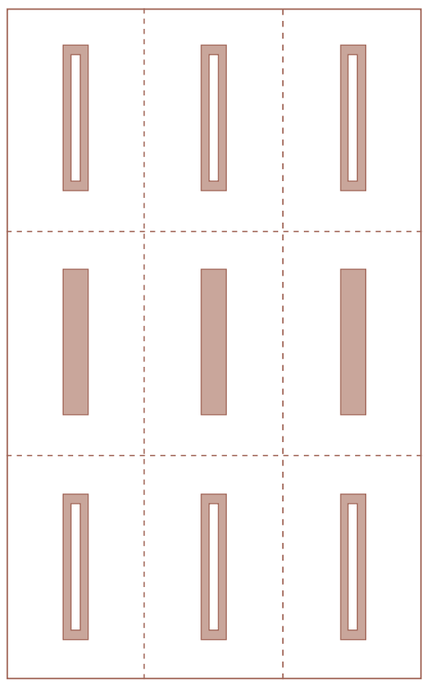
☺ General lighting
☺ GOOD Acoustic

-25%	0.98 s	Reverberation time



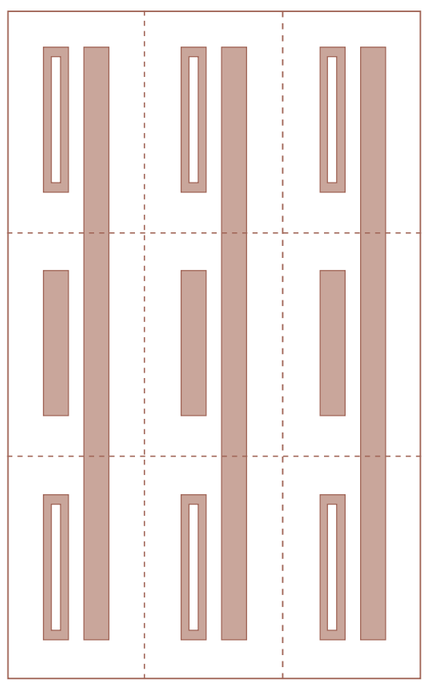
☺ General lighting
☺ ☺ BETTER Acoustic

-40%	0.78 s	Reverberation time



☺ General lighting
☺ ☺ ☺ BEST Acoustic

-50%	0.65 s	Reverberation time



Easy acoustic calculations?

Developed in conjunction with acousticians, the Lumenwerx Acoustix Value Formula (LAVF) is a simple math equation that uses a ratio to determine acoustic needs. In the LAVF we took assumptions that one wall would be glass, three walls and the ceiling are gypsum board and the flooring is concrete. The basis of the equation mimics a poorly performing acoustic space. By applying the ratios, we can determine how many luminaires are required for “Good”, “Better” or “Best” acoustic performance, using the standard ceiling height of 9 feet and 4 foot luminaires.

For advanced calculations please contact your regional sales manager. We have a team of trained experts that will be happy to assist you.

Good: Reverberation time is reduced by 25%
Better: Reverberation time is reduced by 40%
Best: Reverberation time is reduced by 50%

Lumenwerx Acoustix Value Formula.

1. Calculate the square feet of your room (length x width)
2. Select your luminaire
3. Choose the level of acoustical improvement you are looking for and select the associated Acoustix Value:
   ☺ Good ☺ ☺ Better ☺ ☺ ☺ Best
4. Use the Lumenwerx Acoustix Value Formula

Square Feet ÷ Value =	Number of luminaires needed in the room

See next page for illustrated example

* Lumenwerx acoustic calculators were developed to act as a guide.
For precise acoustic performance in a space, please consult an acoustician.

Using the formula

AUDIA (16in x48in)	GOOD ☺	BETTER ☺☺	BEST ☺☺☺
Acoustix value	51	25	17

In the above photo we are showing 3 lit and 3 blank Audia Luminaires

*The complete Acoustix offering value table can be found at the end of the brochure, see page 15.

Lumenwerx Acoustix Value Formula

1. Calculate the square feet of your room:
   (**L**:10ft x **W**:15ft) **150 sq ft**
2. Select your luminaire: **Audia** (16in x 48in)
3. Choose the level of acoustical improvement you are looking for and select the associated Acoustix Value:
   ☺ ☺ **Better : 25**
4. Use the Lumenwerx Acoustix Value Formula

150 ÷ 25 = 6 fixtures
(sq ft) (Acoustix value) (3 luminaires + 3 blanks)

The Acoustix Value Formula is a simple calculator used to establish the recommanded number of acoustical luminaires required in a space. For more complex spaces, or specific materials please contact your regional sales manager. We have a team of trained experts that will be happy to assist you with your calculations.

* Lumenwerx acoustic calculators were developed to act as a guide.
  For precise acoustic performance in a space, please consult an acoustician.

Lumenwerx Acoustix Value Tables

Using the Lumenwerx Acoustix Value Calculator table; you can determine the number of acoustic lit and blank luminaires, required in a space by fixture type. We have three levels of recommended sound reduction good, better and best. Choosing one of these option will reduce the sound accordingly: the best option indicates the best acoustic improvement. The ratios are based on a standard ceiling height of 9 feet.

ROOM DIMENSIONS **UNDER 300 SQ/FT**

PRODUCT	GOOD ☺	BETTER ☺☺	BEST ☺☺☺
Aera 4" Round EchoCore™ 2'x2' Recessed	33	18	14
Aera 4" Square EchoCore™ 2'x2' Recessed	33	18	14
EchoCore™ Blank 2'x2' Recessed	33	18	14
Arro 4 Acoustix 4 ft Direct	22	10	7
Arro 4 Acoustix 4 ft Direct/Indirect	20	10	6
Arro 4 Acoustix 6 ft Direct	32	15	10
Arro 4 Acoustix 6 ft Direct/Indirect	30	14	10
Arro 4 Acoustix 8 ft Direct	43	20	14
Arro 4 Acoustix 8 ft Direct/Indirect	40	19	13
Arro 4 Acoustix 10 ft Direct	53	25	17
Arro 4 Acoustix 10 ft Direct/Indirect	50	24	16
Arro 4 Acoustix 12 ft Direct	64	30	20
Arro 4 Acoustix 12 ft Direct/Indirect	60	28	19
Audia EchoCore™ 12"x48"	38	19	12
Audia EchoCore™ 16"x48"	51	25	17
Cluster Circle Acoustix 22"	30	15	10
Cluster Square Acoustix 22”	38	19	13
Mikro Wafer 20"x24"	38	19	13
Mikro Wafer 20"x36"	55	29	19
Mikro Wafer 20"x48"	78	40	25
Pop EchoCore™ Round Pendant 24"	19	11	8
Pop EchoCore™ Round Pendant 36"	31	18	14
Pop EchoCore™ Round Pendant 48"	44	25	19
Pop EchoCore™ Round Blank Pendant 24"	25	14	11
Pop EchoCore™ Round Blank Pendant 36"	58	32	25
Pop EchoCore™ Round Blank Pendant 48"	105	59	46
Pop EchoCore™ Square Pendant 22	24	14	11
Pop EchoCore™ Square Pendant 33	41	23	18
Pop EchoCore™ Square Blank Pendant 22	33	18	14
Pop EchoCore™ Square Blank Pendant 33	75	42	33
Pop EchoCore™ Round Surface 24"	19	11	8
Pop EchoCore™ Round Surface 36"	31	18	14
Pop EchoCore™ Round Surface 48"	44	25	19
Pop EchoCore™ Round Blank Surface 24"	25	14	11
Pop EchoCore™ Round Blank Surface 36"	58	32	25
Pop EchoCore™ Round Blank Surface 48"	105	59	46
Pop EchoCore™ Square Surface 22	24	14	11
Pop EchoCore™ Square Surface 33	41	23	18
Pop EchoCore™ Square Blank Surface 22	33	18	14
Pop EchoCore™ Square Blank Surface 33	75	42	33
Pop EchoCore™ Round 2'x2' Recessed	24	14	11
Pop EchoCore™ Square 2'x2' Recessed	24	14	11
EchoCore™ Blank 2'x2' Recessed	33	18	14
Pop Recessed Acoustix 1x1 Flush	3	2	1
Pop Recessed Acoustix 1x1 Drop 1"	4	2	1
Pop Recessed Acoustix 1x1 Drop 2"	6	3	2
Pop Recessed Acoustix 1x2 Flush	7	3	2
Pop Recessed Acoustix 2x2 Flush	14	7	4
Pop Recessed Acoustix 2x2 Drop 1"	16	7	5
Pop Recessed Acoustix 2x2 Drop 2"	18	9	6
Pop Recessed Acoustix 2x2 Drop 3"	20	10	6
Pop Recessed Acoustix 2x2 Drop 4"	23	11	7
Pop Recessed Acoustix 4x4 Flush	28	13	9
Pop Recessed Acoustix 4x4 Drop 1"	32	15	10
Rim Verso Acoustix 24"	18	9	6
Rim Verso Acoustix 36"	42	20	14
Rim Verso Acoustix 48"	75	38	25
Squero Acoustix 8"x48"	19	9	6
Squero Acoustix 12"x48"	29	14	8
Squero Acoustix 16"x48"	38	19	12
Squero Acoustix 8" V60, V90, V120 - 2 ft	19	9	6
Squero Acoustix 12" V60, V90, V120 - 2 ft	29	14	8
Squero Acoustix 16" V60, V90, V120 - 2 ft	38	19	12
Squero Acoustix 8" V60, V90, V120 - 3 ft	29	14	9
Squero Acoustix 12" V60, V90, V120 - 3 ft	44	21	12
Squero Acoustix 16" V60, V90, V120 - 3 ft	57	29	18
Squero Acoustix 8" V60, V90, V120 - 4 ft	38	18	12
Squero Acoustix 12" V60, V90, V120 - 4 ft	58	28	16
Squero Acoustix 16" V60, V90, V120 - 4 ft	76	38	24
Squero, Via 1.5 & 2 Acoustix 8" 2 ft - 3 Spoke	29	14	9
Squero, Via 1.5 & 2 Acoustix 12" 2 ft - 3 Spoke	44	21	12
Squero, Via 1.5 & 2 Acoustix 16" 2 ft - 3 Spoke	57	29	18
Squero, Via 1.5 & 2 Acoustix 8" 3 ft - 3 Spoke	43	20	14
Squero, Via 1.5 & 2 Acoustix 12" 3 ft - 3 Spoke	65	32	18
Squero, Via 1.5 & 2 Acoustix 16" 3 ft - 3 Spoke	86	43	27
Squero, Via 1.5 & 2 Acoustix 8" 2 ft - 4 Spoke	38	18	12
Squero, Via 1.5 & 2 Acoustix 12" 2 ft - 4 Spoke	58	28	16
Squero, Via 1.5 & 2 Acoustix 16" 2 ft - 4 Spoke	76	38	24
Togo Acoustix 24"	18	9	6
Togo Acoustix 36"	42	20	14
Togo Acoustix 48"	75	38	25
Via 1.5 & 2 Acoustix 8"x48"	19	9	6
Via 1.5 & 2 Acoustix 12"x48"	29	14	8
Via 1.5 & 2 Acoustix 16"x48"	38	19	12
Via Stil 12"x48"	19	9	6
Via Stil 16"x48"	29	14	8
Via Stil 20"x48"	38	19	12

ROOM DIMENSIONS **OVER 300 SQ/FT**

PRODUCT	GOOD ☺	BETTER ☺☺	BEST ☺☺☺
Aera 4" Round EchoCore™ 2'x2' Recessed	50	28	22
Aera 4" Square EchoCore™ 2'x2' Recessed	50	28	22
EchoCore™ Blank 2'x2' Recessed	50	28	22
Arro 4 Acoustix 4 ft Direct	33	17	11
Arro 4 Acoustix 4 ft Direct/Indirect	31	16	11
Arro 4 Acoustix 6 ft Direct	49	26	17
Arro 4 Acoustix 6 ft Direct/Indirect	46	24	16
Arro 4 Acoustix 8 ft Direct	66	34	23
Arro 4 Acoustix 8 ft Direct/Indirect	62	32	21
Arro 4 Acoustix 10 ft Direct	81	42	28
Arro 4 Acoustix 10 ft Direct/Indirect	76	39	26
Arro 4 Acoustix 12 ft Direct	98	51	34
Arro 4 Acoustix 12 ft Direct/Indirect	91	47	32
Audia EchoCore™ 12"x48"	60	29	19
Audia EchoCore™ 16"x48"	84	39	26
Cluster Circle Acoustix 22"	48	24	16
Cluster Square Acoustix 22”	61	30	20
Mikro Wafer 20"x24"	61	30	20
Mikro Wafer 20"x36"	92	45	30
Mikro Wafer 20"x48"	128	60	40
Pop EchoCore™ Round Pendant 24"	29	16	13
Pop EchoCore™ Round Pendant 36"	48	27	21
Pop EchoCore™ Round Pendant 48"	68	38	30
Pop EchoCore™ Round Blank Pendant 24"	39	22	17
Pop EchoCore™ Round Blank Pendant 36"	89	50	39
Pop EchoCore™ Round Blank Pendant 48"	163	91	72
Pop EchoCore™ Square Pendant 22	38	21	17
Pop EchoCore™ Square Pendant 33	63	35	28
Pop EchoCore™ Square Blank Pendant 22	50	28	22
Pop EchoCore™ Square Blank Pendant 33	116	65	51
Pop EchoCore™ Round Surface 24"	29	16	13
Pop EchoCore™ Round Surface 36"	48	27	21
Pop EchoCore™ Round Surface 48"	68	38	30
Pop EchoCore™ Round Blank Surface 24"	39	22	17
Pop EchoCore™ Round Blank Surface 36"	89	50	39
Pop EchoCore™ Round Blank Surface 48"	163	91	72
Pop EchoCore™ Square Surface 22	38	21	17
Pop EchoCore™ Square Surface 33	63	35	28
Pop EchoCore™ Square Blank Surface 22	50	28	22
Pop EchoCore™ Square Blank Surface 33	116	65	51
Pop EchoCore™ Round 2'x2' Recessed	38	21	17
Pop EchoCore™ Square 2'x2' Recessed	38	21	17
EchoCore™ Blank 2'x2' Recessed	50	28	22
Pop Recessed Acoustix 1x1 Flush	5	3	2
Pop Recessed Acoustix 1x1 Drop 1"	7	3	2
Pop Recessed Acoustix 1x1 Drop 2"	8	4	3
Pop Recessed Acoustix 1x2 Flush	11	5	4
Pop Recessed Acoustix 2x2 Flush	21	11	7
Pop Recessed Acoustix 2x2 Drop 1"	24	12	8
Pop Recessed Acoustix 2x2 Drop 2"	28	14	10
Pop Recessed Acoustix 2x2 Drop 3"	31	16	11
Pop Recessed Acoustix 2x2 Drop 4"	35	18	12
Pop Recessed Acoustix 4x4 Flush	43	22	15
Pop Recessed Acoustix 4x4 Drop 1"	48	25	17
Rim Verso Acoustix 24"	28	14	9
Rim Verso Acoustix 36"	65	32	22
Rim Verso Acoustix 48"	120	59	41
Squero Acoustix 8"x48"	29	15	10
Squero Acoustix 12"x48"	45	22	14
Squero Acoustix 16"x48"	58	29	19
Squero Acoustix 8" V60, V90, V120 - 2 ft	29	15	10
Squero Acoustix 12" V60, V90, V120 - 2 ft	45	22	14
Squero Acoustix 16" V60, V90, V120 - 2 ft	58	29	19
Squero Acoustix 8" V60, V90, V120 - 3 ft	44	23	15
Squero Acoustix 12" V60, V90, V120 - 3 ft	68	33	21
Squero Acoustix 16" V60, V90, V120 - 3 ft	87	44	29
Squero Acoustix 8" V60, V90, V120 - 4 ft	58	30	20
Squero Acoustix 12" V60, V90, V120 - 4 ft	90	44	28
Squero Acoustix 16" V60, V90, V120 - 4 ft	116	58	38
Squero, Via 1.5 & 2 Acoustix 8" 2 ft - 3 Spoke	44	23	15
Squero, Via 1.5 & 2 Acoustix 12" 2 ft - 3 Spoke	68	33	21
Squero, Via 1.5 & 2 Acoustix 16" 2 ft - 3 Spoke	87	44	29
Squero, Via 1.5 & 2 Acoustix 8" 3 ft - 3 Spoke	65	34	23
Squero, Via 1.5 & 2 Acoustix 12" 3 ft - 3 Spoke	101	50	32
Squero, Via 1.5 & 2 Acoustix 16" 3 ft - 3 Spoke	131	65	43
Squero, Via 1.5 & 2 Acoustix 8" 2 ft - 4 Spoke	58	30	20
Squero, Via 1.5 & 2 Acoustix 12" 2 ft - 4 Spoke	90	44	28
Squero, Via 1.5 & 2 Acoustix 16" 2 ft - 4 Spoke	116	58	38
Togo Acoustix 24"	28	14	9
Togo Acoustix 36"	65	32	22
Togo Acoustix 48"	120	59	41
Via 1.5 & 2 Acoustix 8"x48"	29	15	10
Via 1.5 & 2 Acoustix 12"x48"	45	22	14
Via 1.5 & 2 Acoustix 16"x48"	58	29	19
Via Stil 12"x48"	29	15	10
Via Stil 16"x48"	45	22	14
Via Stil 20"x48"	58	29	19

Lumenwerx

Making light work for you

Designed with human performance and technical optimization in mind, Lumenwerx offers an ever expanding portfolio of acoustic lighting solutions for many applications:

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- Conference rooms
- Libraries
- Education
- Foyer/ Lobby
- High ceiling application
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- Cafeterias
- Multi-Use room
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- Hospitality

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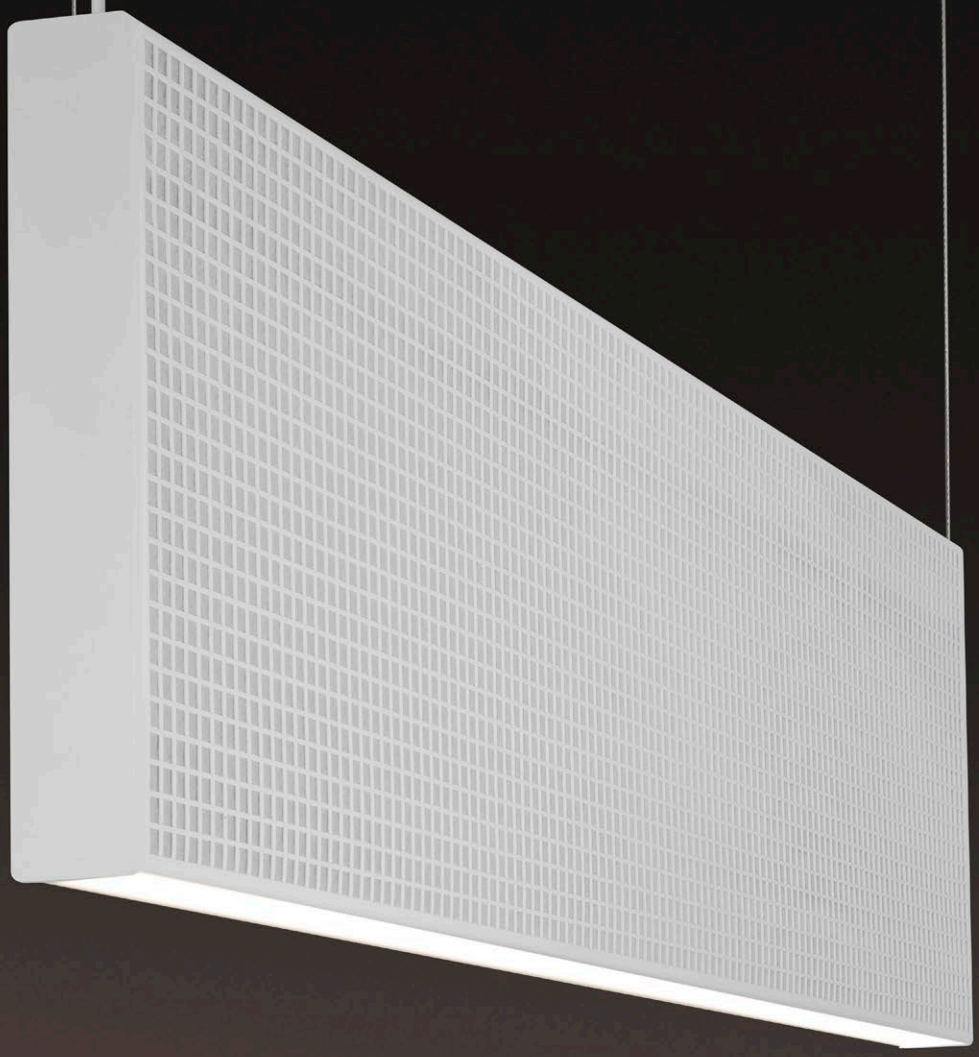
acoustix



Lumenwerx
3737 boul. de la Côte-Vertu
Saint-Laurent, QC
H4R 2C9

lumenwerx.com
T.: 514.225.4304
F.: 514.931.4862

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