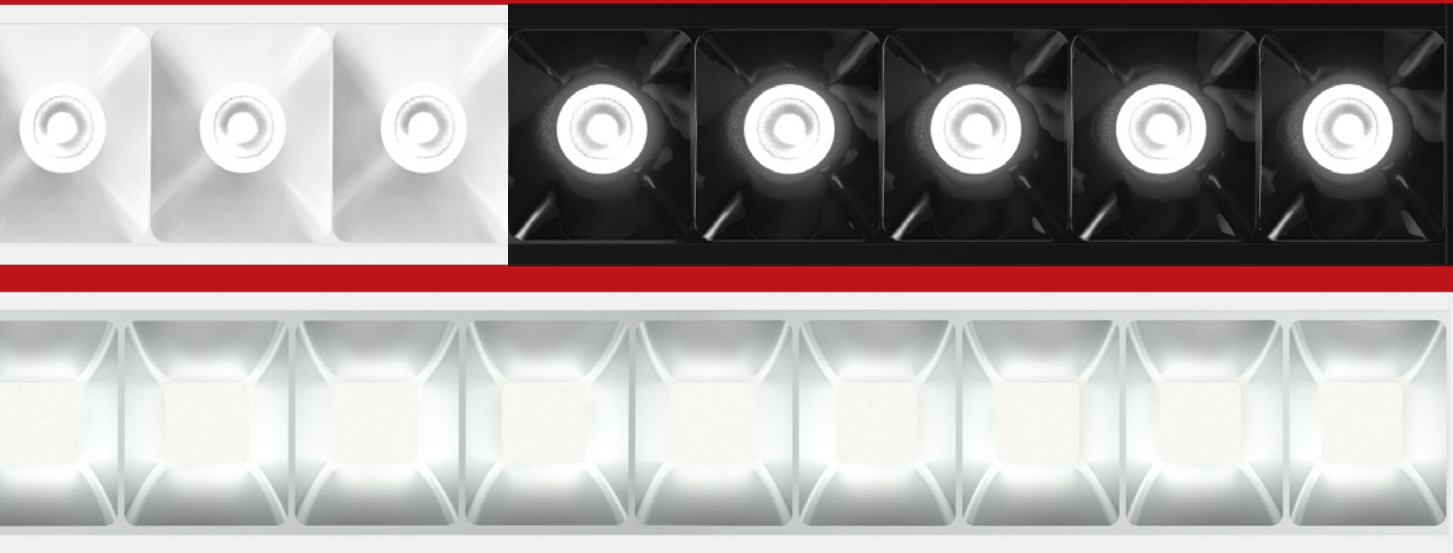


SQUERO

A multi textured lighting system



LUMENWERX





Squero overview

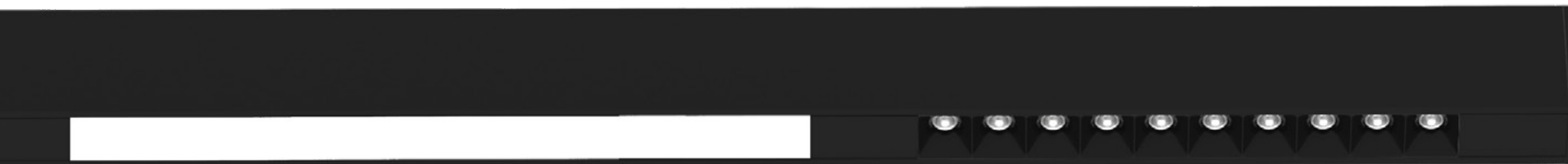
Squero brings new style and texture to linear lighting systems: a crisp profile, multiple mounting options, distinctive optics, and the ability to arrange those optics in custom combinations.

Less than 2" wide, Squero offers a variety of visual textures, both in the appearance of the luminaire and in the quality of the light itself.

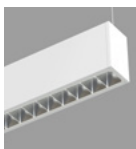
Squero installs in various ceiling types, in walls, and as pendants; as discrete luminaires or in continuous runs; and in patterns with both level and inside corners.

Squero offers distinctive optics for direct illumination, choose from parabolic louver, miniature reflector, and HLO diffuser. Each optic provides a distinctive luminous presence, as well as photometric performance. For indirect illumination, Squero provides a widespread optic.

Optics can be combined in a single luminaire, together with an adjustable accent module. Together, the combination of these standard elements provide a custom treatment for the application.



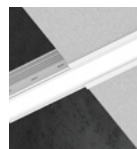
Direct Optics



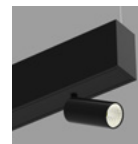
MPL and SPL - Parabolic Louver Optics are offered in two finishes with excellent shielding: Matte, for a quiet glow, and specular, for sharp cut off.



MRO - Miniature reflector optic with multiple beam spreads, provides distinctive and highly comfortable direct task illumination.

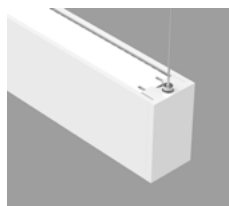


HLO - High Efficiency Lambertian Optic provides good transmission and source obscuration from a uniformly luminous surface.

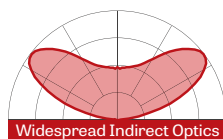


Adjustable Accent Module (AAM) has a small-scale cylinder with 360° x 90° aiming, a TIR optic, and driver in the Squero housing.

Indirect Optic



Widespread Indirect Optic (WIO) uses edge-lighting and a micro-structured light guide to provide a batwing uplight distribution.



Light output

Squero offers nominal light output options from 350-1000 lumens per foot for both direct and indirect illumination

Outstanding Visual Comfort

The downlight from narrow LED luminaires presents significant challenges of discomfort glare in general lighting applications. Squero's parabolic optics, although less than 2" across, address this problem with deep shielding and effective cut-off, resulting in outstanding visual comfort. The table below illustrates the benefits of parabolic optics using two metrics: the Universal Glare Rating, or UGR (described in the sidebar) and the intensity limits of ANSI-IES RP 1-12 for viewing VDT's.

Optics	Cut-Off Angle	Spacing Criterion	500 lm/ft (20x 8' luminaires)		750 lm/ft (12 x 8' luminaires)	
			VDT viewing	UGR	VDT viewing	UGR
SPL - Specular Parabolic Louver	45	1.1	Intensive	11	Intensive	12
MPL - Matte Parabolic Louver	47	1.1	Intensive	12	Intensive	13
MRO 55° Beam	53	0.8	Intensive	14	Intensive	15
HLO - Diffuser Optic	81	1.1		21		20
UGR analysis: 500 lms/ft in 40' x 40' x 9.5' space, 80-50-20 reflectance. 40 FC average maintained (.85 LLF) and avg:min of 2:1 750 lms/ft in 40' x 40' x 12' space, 80-50-20 reflectance. 40 FC average maintained (.85 LLF) and avg:min of 2.5:1						



Universal Glare Rating (UGR)

The UGR models glare from lighting in application, rather than a simple photometric value for a luminaire. The model considers luminaire quantity and luminance in any layout; ceiling luminance, room dimensions and reflectances; and viewing position. The result is a number from 5 (best) to 48 (worst). A UGR of 16, corresponding to a visual comfort probability of 80%, is the minimum recommended for most commercial workspaces. Ratings of 10-14 are preferable for long and intensive working hours.



Mounting

Recessed

Squero fits common grid ceilings, installs vertically in walls, and offers flanged and trimless options. Drivers and LED boards are serviceable from below.

Pendant

Squero can be suspended by cable or rigid stem. Pendant luminaires offer direct/indirect lighting.

Surface

Squero installs directly to the ceiling.



Exit

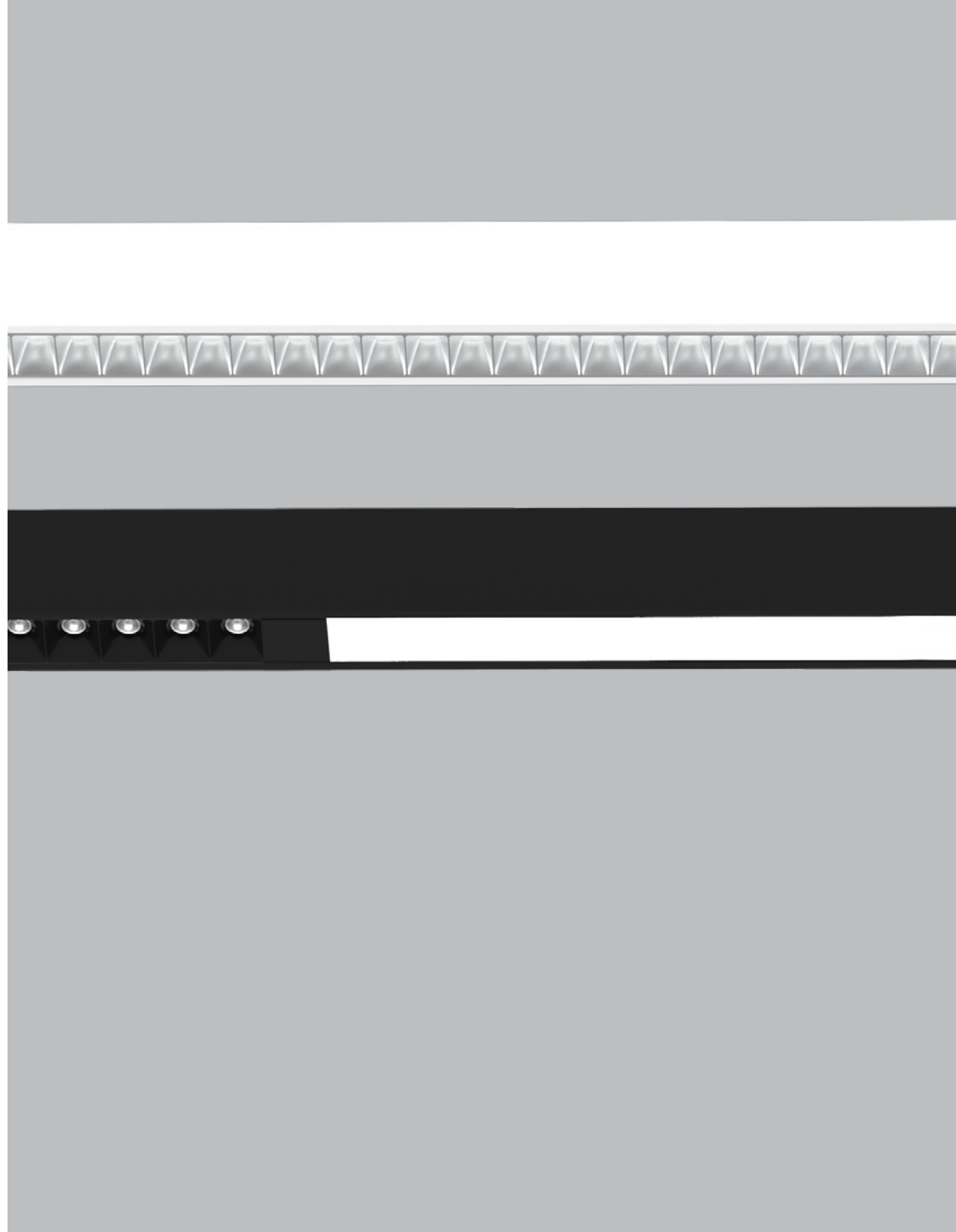
Squero Combinations

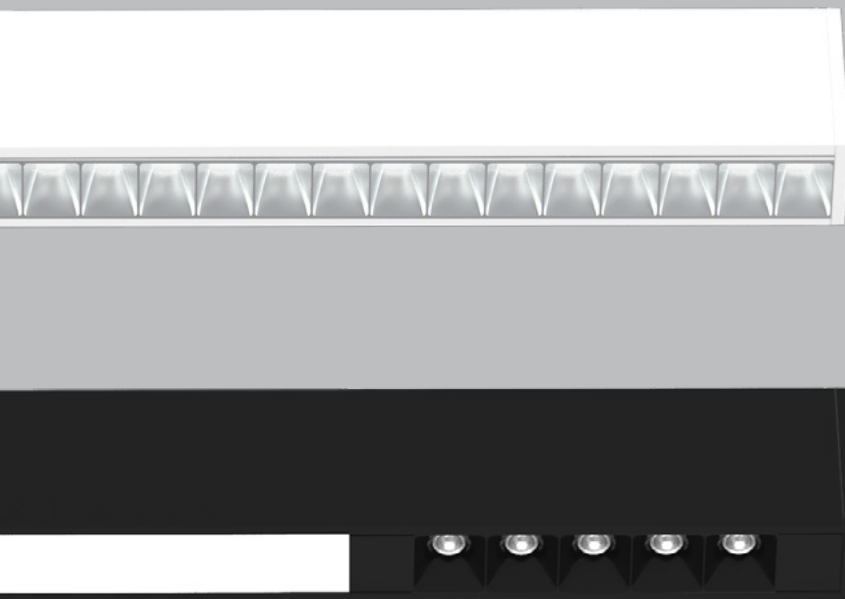
Squero Combinations bring new style and flexibility to linear lighting systems. Combine any of the six Squero optics in virtually unlimited arrangements using any Squero mounting option, whether in discrete luminaires, continuous runs, or patterns.

Combinations of indirect, diffuse direct, and concentrated direct illumination modules from different Squero optics can create richly layered lighting effects. MRO modules are 6" long; all others are 12" long.

Using the different modules and spacer blanks, a customized Squero Combination can provide a distinctive visual rhythm and texture. Widely spaced optics even permit lower power densities from a single luminaire (and fewer power feeds).

Squero Combinations open up fresh choices for design flexibility and custom approaches

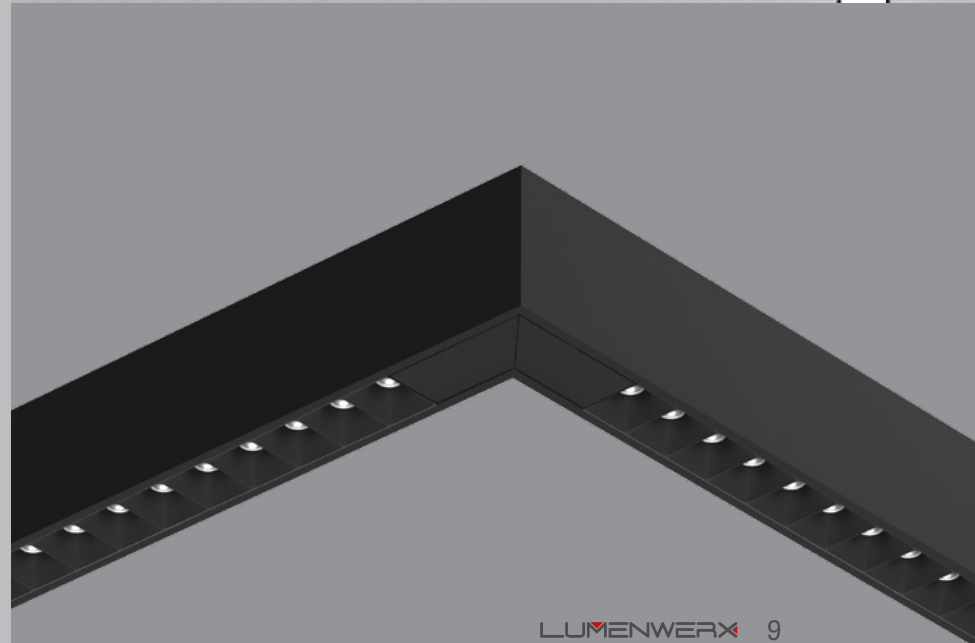
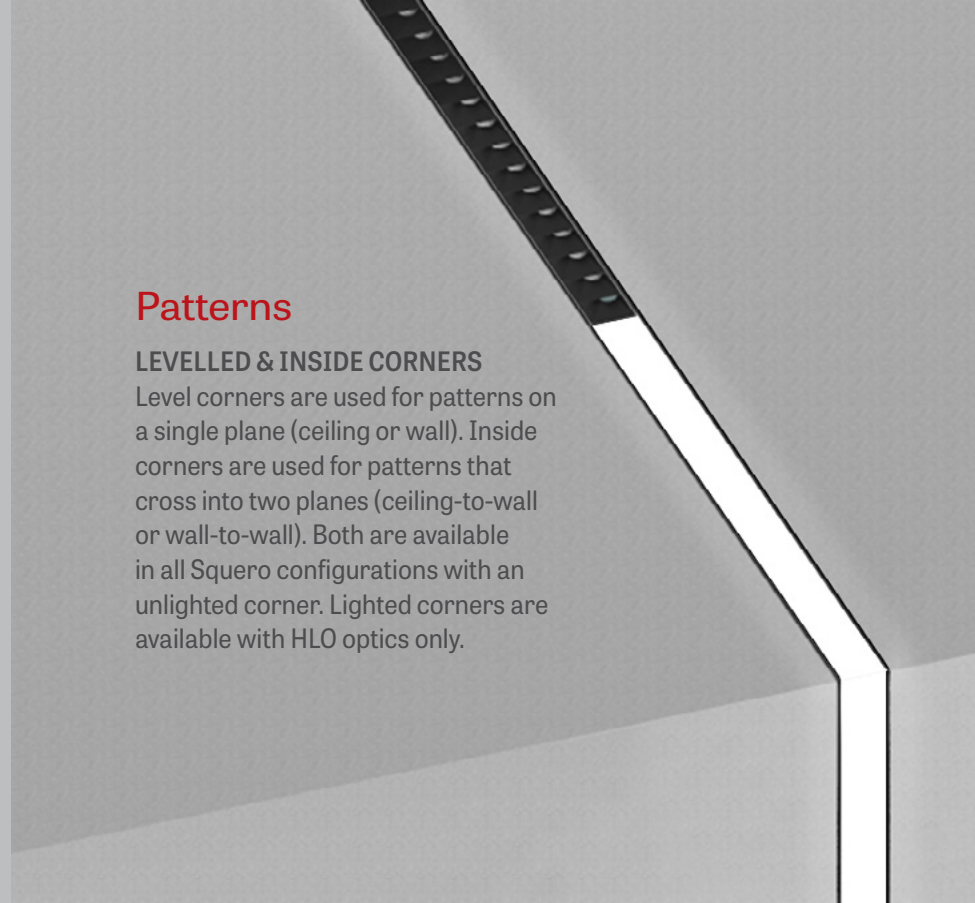




Patterns

LEVELLED & INSIDE CORNERS

Level corners are used for patterns on a single plane (ceiling or wall). Inside corners are used for patterns that cross into two planes (ceiling-to-wall or wall-to-wall). Both are available in all Squero configurations with an unlighted corner. Lighted corners are available with HLO optics only.



SPL and MPL - Parabolic Louver

Squero's parabolic louver optics provide excellent shielding and a pleasing crisp visual texture. The precisely molded louvers consist of 1" deep blades and side reflectors with shielding of 50° lengthwise and 45° cross wise.

The parabolic contour of the blades and side reflectors direct light into a comfortable downlight distribution with a spacing criterion of 1.1, while minimizing shadows from the LED array above each cell.

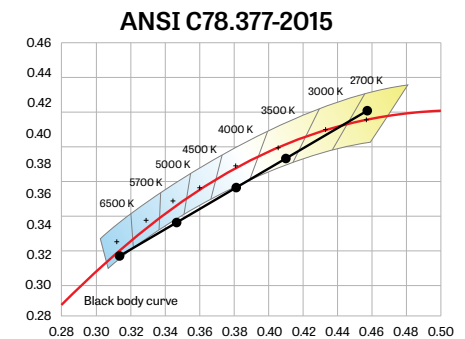
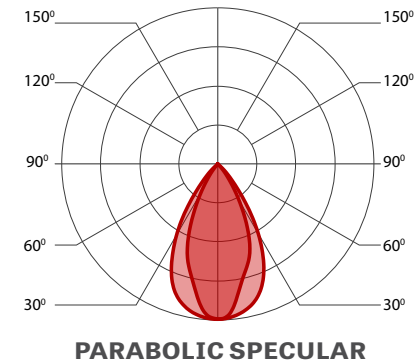
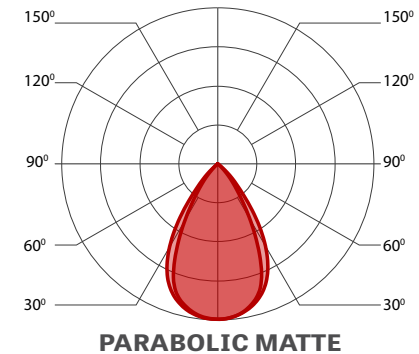
Two finishes are available. Specular (SPL) provides higher efficacy, sharper cut-off, and an ultra quiet appearance at shallow viewing angles. Matte (MPL) offers a softer appearance, a wider beam spread, and gentle brightness transition at cut-off.



RECESSED - PARABOLIC MATTE



PENDANT & SURFACE - PARABOLIC SPECULAR





Squero Parabolic is available with ChromaWerx Sola, pre-programmed, and Duo, independent control of output and color, for tunable white capability.

A custom linear array of alternating color temperature mid-flux LED's operate at reduced drive current to optimize efficacy and lumen maintenance.

ChromaWerx drivers are programmed to limit maximum light output and power usage across all color temperatures. CRI is maintained above 80 & 90.

CHROMAWERX SOLA

ChromaWerx Sola dims output while warming the color temperature in a pre-determined relationship. Dimming range is programmable, but the default option runs from 3500K at 100% full power to 2700K at 5% full power. CRI is maintained above 80 throughout the dimming range.

CHROMAWERX DUO

ChromaWerx Duo enables the user to set color temperature and light output independently. Commonly called "tunable white", ChromaWerx Duo provides the range from warm to cool color that can be useful for helping to entrain circadian rhythms, stimulate alertness, and compensate for jet lag, among other applications. The ChromaWerx drivers are programmed to limit maximum light output and power usage across all color temperatures. CRI is maintained above 80.



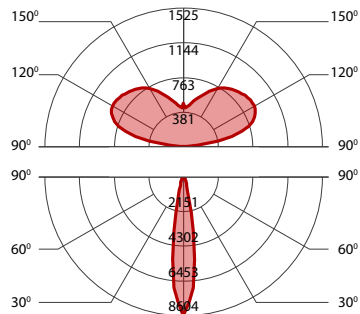
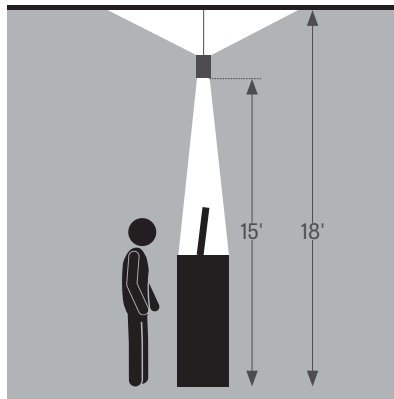
MRO - Miniature Reflector Optic

The LumenWerx Miniature Reflector Optic (MRO) provides a well-controlled downlight beam that is remarkably comfortable – especially for a small LED luminaire – and an intriguing visual texture.

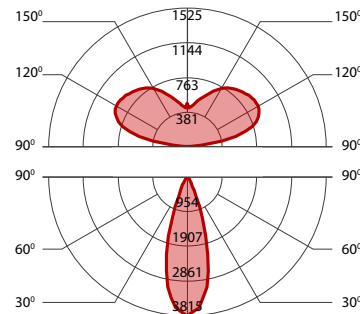
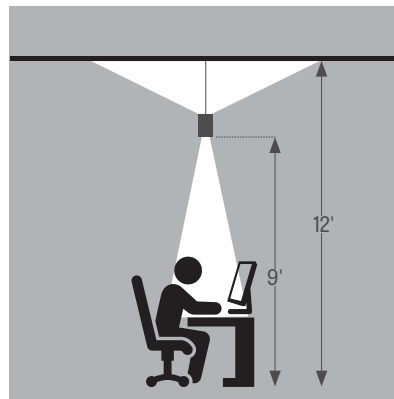
Different TIR elements offer a choice of beam spreads: narrow (18° with SC of 0.3), medium (35° with SC of 0.6), and wide (55° with SC of 0.9). These concentrated distributions can provide effective task illumination in a variety of applications.

Paired with Widespread Indirect Optics, MRO provides both comfortable and generous task/ambient lighting. The diagrams below illustrate Squero Direct/Indirect with downlight at 350 lumens per foot and uplight at 600 lumens per foot.

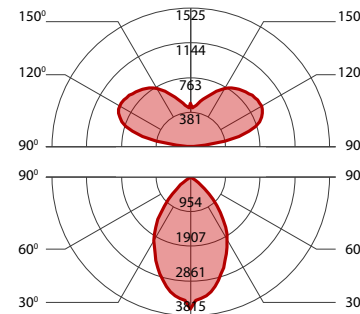
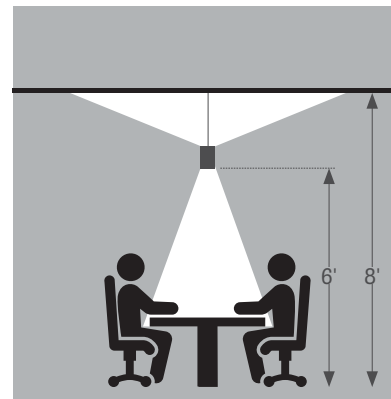
**Narrow 18 degree
350 lm/ft**



**Medium 35 degree
350 lm/ft**

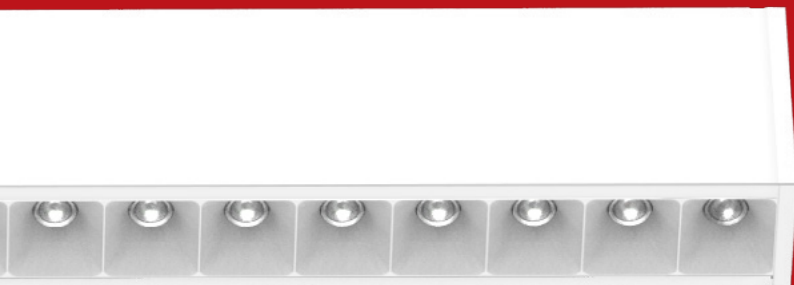


**Wide 55 degree
350 lm/ft**

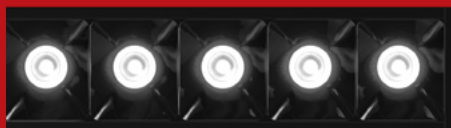




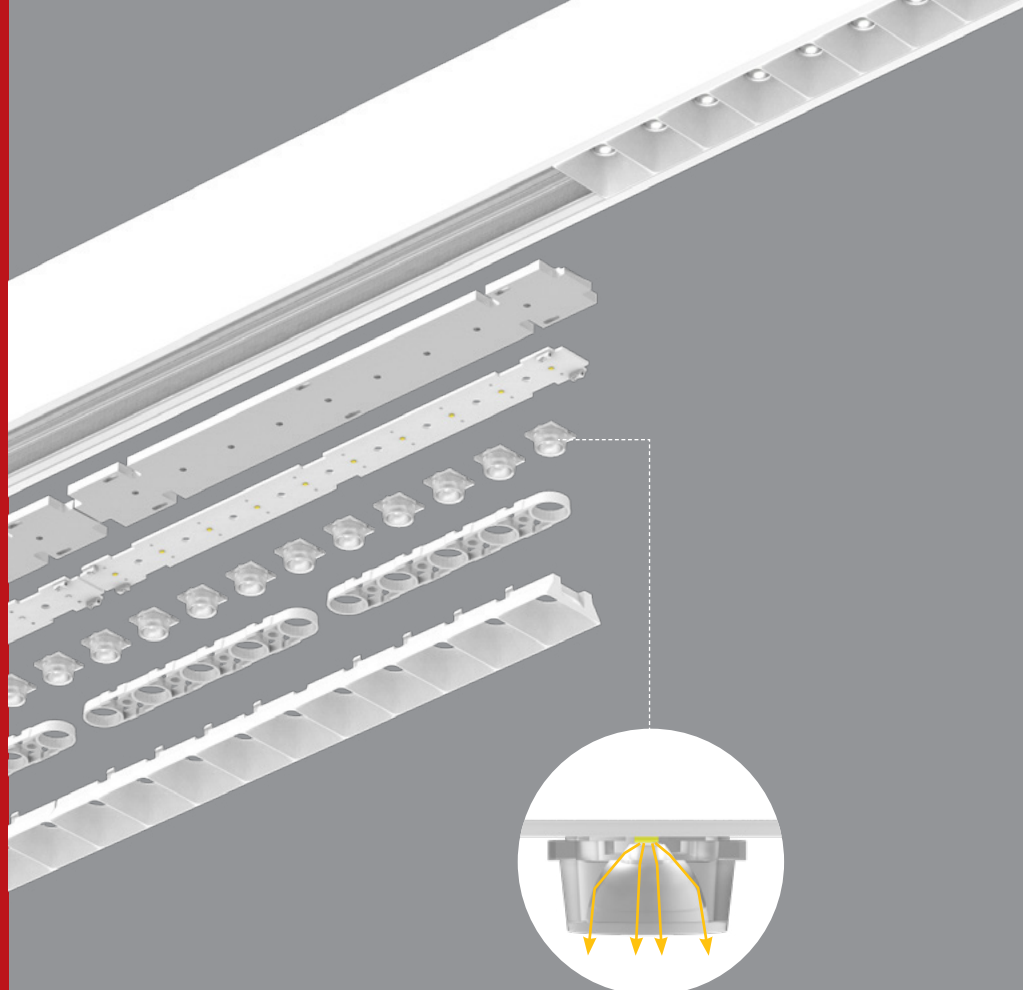
RECESSED - for grid and drywall ceilings



PENDANT & SURFACE



6"



The Miniature Reflector Optic locates individual, precisely molded TIR elements over each LED emitter and further shields the source with deep parabolic reflectors. The optic is available in a specular black or gloss white finish.

Individual MRO modules are 6" and include five emitters. In a dedicated MRO luminaire, the modules run end-to-end in a continuous array, with only a slight separation at the juncture of two luminaire housings.

In a Squero Combination, the 6" MRO modules can be used separately, along with other optics and blank covers.



RECESSED - for grid and drywall ceilings

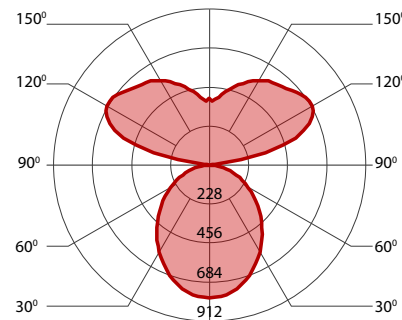


PENDANT & SURFACE

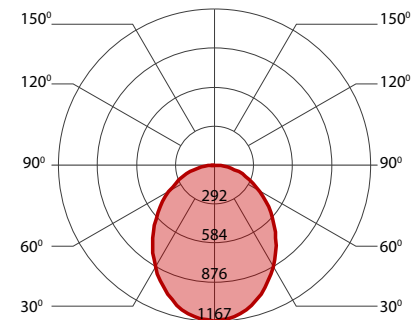
HLO - High-Efficiency Lambertian Optic

The High-Efficiency Lambertian Optic (HLO) creates a distinctive line of brightness. The shielding consists of diffusing 0.075" thick acrylic, with up to 88% transmission and good source obscuration. Combined with matte white side reflectors, the diffuser creates an efficient optical chamber with uniform luminosity.

HLO Luminaire brightness is controlled by the flux-to-shielding area ratio. For visual comfort, avoid high lumen output unless Squero is installed in a high ceiling application. Spacing criteria are 1.2 longitudinal x 1.1 lateral.



HLO D/I WITH WIO



HLO DIRECT





RECESSED - for grid and drywall ceilings

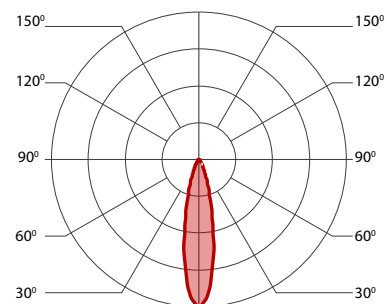


PENDANT & SURFACE

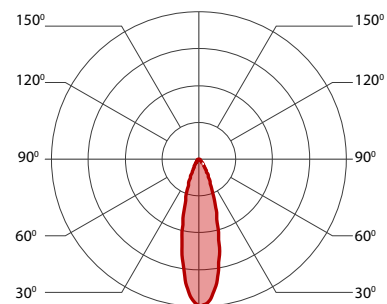
AAM - Adjustable Accent Module

The Adjustable Accent Module (AAM) features a Ø 1.6" x 3.2" cylinder that rotates 360° and tilts 90°. The LED light source is coupled with TIR optics to provide beam angles of 21°, 30°, and 36° while producing up to 600 lumens. LED light source CCT options are 3000K, 3500K, or 4000K, available in either 80 CRI or 90 CRI.

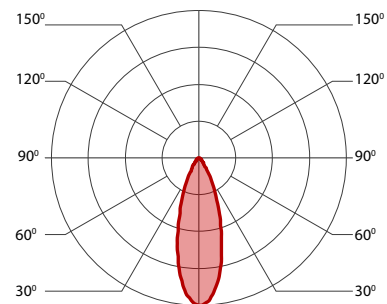
The AAM module can be selected in either a white or black finish and a honeycomb louver accessory is also available. The AAM driver is mounted above the cylinder, inside the SQUERO housing and accepts universal input voltage (120-277VAC) while providing 0-10V dimming control.



AAM 21° Beam Angle



AAM 30° Beam Angle



AAM 36° Beam Angle



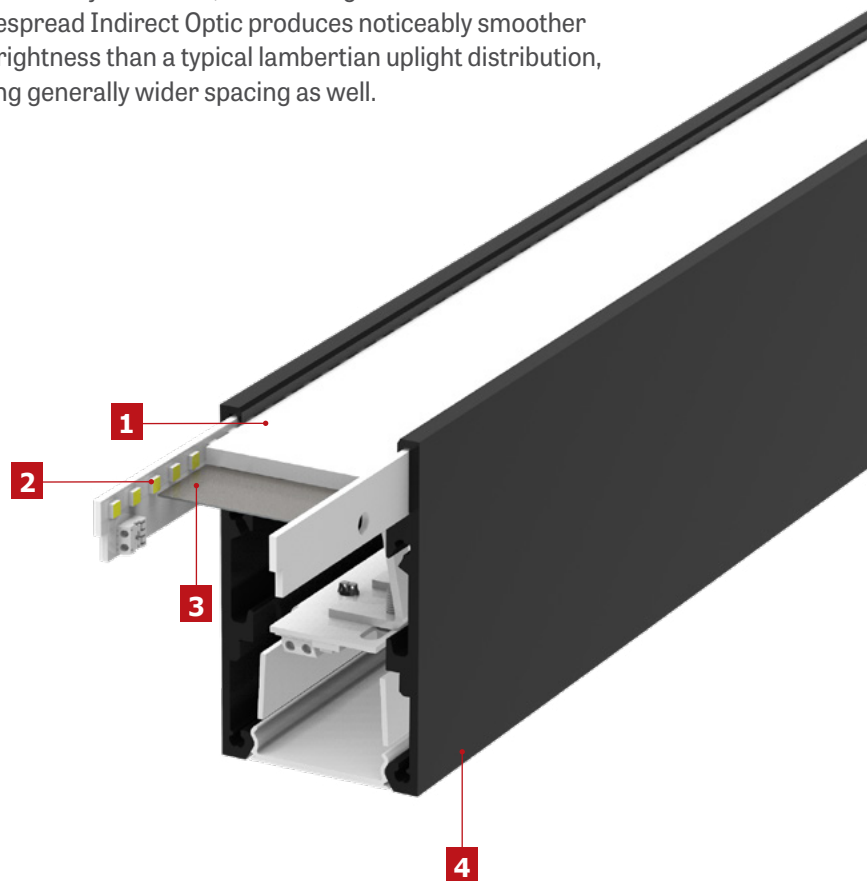




WIO - Widespread Indirect Optics

Achieving widespread indirect light distribution from an attractively narrow luminaire presents a serious optical challenge. The LumenWerx Widespread Indirect Optic (WIO) uses two vertically oriented LED arrays that couple light into the edges of a linear light guide. A specially designed TIR/microstructure extracts light into the desired “batwing” distribution.

Peak intensity hits at 120° while suppressing direct uplight. Peak-to-zenith intensity ratio is 2:1, outstanding for a narrow luminaire. The Widespread Indirect Optic produces noticeably smoother ceiling brightness than a typical lambertian uplight distribution, permitting generally wider spacing as well.



(1) LIGHT GUIDE

Optical-grade acrylic laminated with micro-structure optical film extracts light into a widespread “batwing” distribution.

(2) LED BOARD

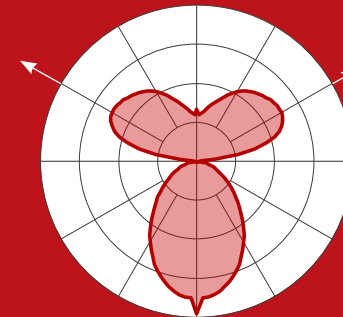
High-flux LED's operate at reduced drive current; metal core board and extruded aluminum cartridge provide thermal dissipation. Color consistency within three SDCM.

(3) REFLECTOR

96% reflective aluminum redirects light into uplight distribution.

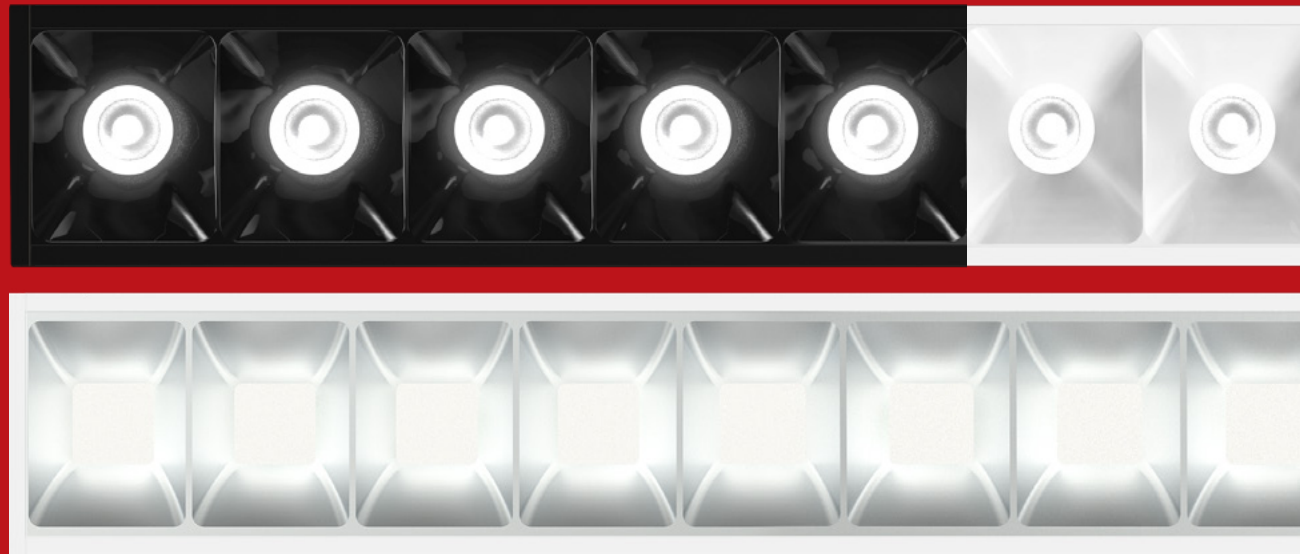
(4) CARTRIDGE

Extruded aluminum frame assures precise optical alignment and easy LED array replacement.



SHOWN WITH
DIRECT HLO OPTICS

Squero's characteristic WIO batwing delivers peak intensity at 120° with the ratio of peak:zenith intensity of 2:1



LUMENWERX

www.lumenwerx.com

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