Outdoor Lighting Code Committee
September 3, 2025
Subcommittee work/modifications*

*All work here is new or modified for 09/03/2025 discussion unless otherwise noted.

DEFINITIONS

CCT (CORRELATED COLOR TEMPERATURE)

- **CCT (correlated color temperature)**. The measured color appearance of light emitted by a light source described using a nominal value stated in kelvins (K). Lower CCTs (1900 K and below) appear very warm or amber. Medium CCTs (greater than 1900k not to exceed 2700k) appear “warm white,” similar to standard incandescent bulbs. Medium-High CCTs (greater than 2700k not to exceed 3500k) appear warm yellow and yellow, and High CCTs (greater than 3500k) appear “white, “cool white” or “blue.”

  Meeting Notes: A color chart will be provided in the code to show the ranges of color represented in Kelvin.

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DEVELOPED AREA

- **Developed Area.** All improved surface areas likely to be occupied or regularly visited by people: building, structures, storage, service, and manufacturing areas, assembly areas, parking, loading driveways, and landscaping related to the uses and betterment of the area. This shall not apply to areas that have been cleared only. Only those areas meeting this definition shall be counted in the calculation of allowed lumens as these are the areas requiring lighting. Developed area shall not include areas reserved as *undisturbed open space* or *no-build utility easements.*

  Meeting Notes: Subcommittee has heard and understood that distinguishing between commercial and residential developed area may be problematic. As a result, we have recombined them into a single definition.

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FULLY SHIELDED

- **Fully Shielded:** A *luminaire* designed or shielded in such a manner that no light is emitted, either directly or indirectly, at or above a horizontal plane running through the lowest light-emitting part of the luminaire. This applies to all lateral angles around the luminaire. Such lighting performance shall be as determined by a photometric test report from a nationally recognized independent testing laboratory. Any structural part of the luminaire providing full shielding shall be permanently attached. Light fixtures with an IES BUG rating of U0 shall be considered fully shielded (ANSI-IES TM-15-20).

  Meeting Notes: A diagram will be provided in the code to visually indicate what is meant by fully shielded.

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HOUSE SIDE SHIELDING

- **House-side Shielding.** A house-side shield is an attachment for an outdoor light fixture—especially streetlights, parking lot lights, or yard lights—that reduces *light trespass.*

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LIGHTING AREAS

- **Lighting areas:** The base or ambient light levels allowed in Tucson and Pima County, designed to protect sensitive areas and support balance with economic growth.

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LIGHT POLLUTION

- **Light pollution:** The human alteration of light levels in the outdoor environment from those occurring naturally.

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LIGHT TRESPASS

- **Light trespass:** Unwanted or intrusive artificial light that extends beyond the property line of the site where the light source is installed, resulting in illumination of another property without permission.

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NARROW-BAND AMBER LED

- **Narrow-Band Amber LED.** Quasi-monochromatic source with a maximum radiant flux (in Watts per nm) lying within the 585-605 nm spectral range and having full width half maximum smaller than 18nm. Narrow Band Amber LEDs emit mostly yellow amber light, and emit no blue light. This translates to less than 1,700k.

  Meeting Notes: For clarity, this definition has been modified to include the Kelvin equivalent.

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PHOSPOR-CONVERTED AMBER LED

- **Phosphor-Converted Amber LED.** Non-white light source that uses a LED with a phosphor to produce a broad amber emission; requirement that less than 7% of the light emitted in 380-780 nm be emitted in 380-500 nm. Phosphor-coated Amber LEDs work by using a phosphor coated filter which works to convert blue light mostly to amber light. This translates to less than 1,900k.

  Meeting Notes: For clarity, this definition has been modified to include the Kelvin equivalent.

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SKY GLOW

- **Sky glow.** The brightening of the night sky that results from the scattering and reflection of light from the constituents of the atmosphere (gaseous molecules and aerosols), in the direction of the observer. It has two separate components: natural sky glow and artificial sky glow.
    - Natural sky glow: The part of sky glow which is attributable to natural sources. It is attributable to starlight, zodiacal light (scattering of sunlight from dust in the solar system), airglow (radiation from luminescent processes in the earth's upper atmosphere), and (on a cyclical basis) moonlight.
    - Artificial sky glow: The part of sky glow which is attributable to scattering of light from human-based sources of radiation (e.g. outdoor electric lighting, including radiation that is emitted directly upward and radiation that is reflected from surfaces.

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CODE ADJUSTMENTS OR MODIFICATIONS

SECTION 101

- **SECTION 101.3 Purpose and Intent.** The purpose of this code is to preserve the relationship of the residents of the City of Tucson, Arizona and Pima County, Arizona to their unique desert environment through protection of access to the dark night sky. Intended outcomes include continuing support of astronomical activity and minimizing wasted energy, while not compromising the safety, security, and well being of persons engaged in outdoor night time activities. It is the intent of this code to control the obtrusive aspects of excessive and careless outdoor lighting usage while preserving, protecting, and enhancing the lawful nighttime use and enjoyment of any and all property. All light should have a clear purpose, be directed only where it is needed, and no brighter than necessary. It is recognized that developed portions of properties may be required to be unlit, covered, or have reduced lighting levels in order to allow enough lumens in the lighted areas to achieve light levels in accordance with nationally recognized recommended practices and in accordance with the Five Principles for Responsible Outdoor Lighting published by the Illuminating Engineering Society: (1) Use light only if needed; (2) distribute light only where it is needed; (3) use light that is no brighter than needed; (4) control light so it is on only when needed; and (5) use warmer color light when possible.

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SECTION 401

Meeting Notes: Substantial changes have been made to Section 401 of the OLC. Please carefully note changes to section numbers where they have occurred as these will no longer match the current code.

- **401.1 General.** Section 401 provides requirements for the total light output permitted per acre for the different lighting areas, fixture shielding requirements, and limitation of light trespass. These requirements shall be met for all lighting installations subject to this code, unless specifically exempted by Chapters 5, 6, 7, and 8.

- **401.2 Total outdoor light output.** The total amount of light, measured in lumens, from all outdoor light sources. Total outdoor light output shall be the sum of the lumen rating of all installed outdoor lighting fixtures as defined by lamp manufacturers. Total outdoor light output shall not exceed the lumen limits listed in Table 401.1. In the table, “total” means the sum of shielded/fully cutoff shielded and unshielded/non-fully cutoff light.

    - **2.** Fifty percent of the lumens from underwater decorating uplighting unless the fixture is aimed at an angle of less than 45 degrees above the horizontal; in which case the calculated lumens is calculated at 10 percent of the rated lumens.

      Meeting Notes: A diagram will be provided in the code for visual reference.

    - **3.** Fully shielded fixtures installed under canopies and overhangs that extend no less than 24 inches beyond the mounting surface of the fixture shall be counted as zero lumens when installed no greater than 24 inches below the canopy, overhang, or eave.

      Meeting Notes: A diagram will be provided in the code for visual reference.

- **401.3 Shielding Requirements.** All light fixtures that are required to be fully shielded/fully cutoff shall be installed in such a manner that the shielding, or fully cutoff shielded effect, is effective and permanent.

  Meeting Notes: Unchanged from February 2025 revision, but is included for clarity in numbering.Shielding requirements is now a separate subsection of the code from Light Trespass.

- **Section 401.4 Light Trespass (previously part of section 401.3).**

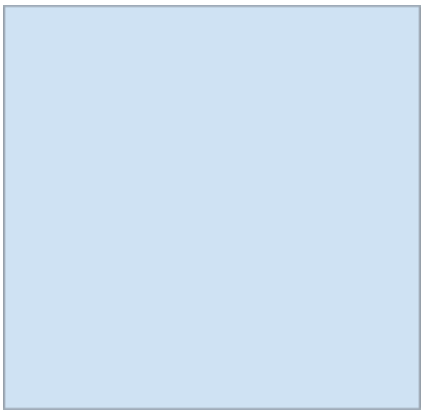
  - **1. Mounting height.** All lighting abutting residential property shall be installed not higher than 10 feet above grade at the property line and no higher than a line rising 20 degrees above the 10 feet until 100 feet from the property line, measured perpendicular to the lot line.

  - **2. House Side Shields.** Outdoor lighting fixtures closer to the lot line than the mounting height of the fixture, measured perpendicular to the lot line, abutting residential property shall have internal house-side shields.

  - **3. Fixtures within 25 feet of residential lot lines.** Luminaires installed within 25 feet of abutting residential property shall be fully shielded.

  - **4. Flood lamps and spot lamps**. When visible from any abutting residential property, flood or spot lamps shall be aimed straight down (vertical) or at an angle not to exceed 30 degrees away from vertical.

    Note: A diagram will now follow 401.4.1 to provide visual assistance.

- **Section 401.5 (previously 401.4) Unshielded lighting.** Unshielded fixtures or lighting sources shall not exceed 3,000 lumens per luminaire.

    - **Exception to 401.5:** Unshielded lighting installed in accordance with Chapters 5 and 6.

- **Section 401.6 (previously 401.5). Optional compliance method for single family residential compliance.** In lieu of calculating total lumens per Section 401.2, a single residential lot of any size shall be considered in compliance with the Lumen Cap if it has a maximum of 5 – 850 lumen (60 watt incandescent or 13 watt compact fluorescent) Full Cut-Off luminaires in Lighting Areas E3, E3a & E2 or a maximum of 4 – 550 lumen (40 watt incandescent or 9 watt compact fluorescent) in Areas E1c, E1b & E1a. If this option is utilized, no unshielded luminaires are allowed.

  Meeting Notes: Reverting back to the 2012 optional method for compliance at this time and removing content from February 2025 revision.

- **401.7 (was previously 401.6) Season decorations.**

  Meeting Notes: No changes; shown here for clarity in numbering.

- **401.8 Festoon lighting.** Festoon lighting shall contribute to total lumens.

  Meeting Notes: This is an addition to the code to clarify and acknowledge festoon lighting as a common type of lighting in use.

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TABLE 401.1 - COMMERCIAL LIGHTING

Maximum Total Outdoor Light Output Requirements Lumen Caps:
Developed Area Lumens per Acre

MEETING NOTES: UNCHANGED FROM AUGUST 2025 OLCC MEETING

COMMERICAL OPTION 1- AMBER

OPTION 1 - AMBER	**LIGHTING AREA**					
	E3	**E3a**	**E2**	**E1c**	**E1b**	**E1a**
Option 1A- Mostly amber LED, all lighting fully-shielded (1,2)	**E3 PC Amber**	**E3a PC Amber**	**E2 PC Amber**	**E1c NB Amber**	**E1b NB Amber (3)**	**E1a NB Amber (3)**
Total lumens (amber + non-amber) All lighting shall be fully-shielded	280,000	200,000	156,000	125,000	48,000	18,000
Limit on non-amber lighting sources	23,800	13,600	10,600	6,000	3,000	3,000
Limit on unshielded light sources	0	0	0	0	0	0
Option 1B- Mostly amber LED (1,2)	**E3 PC Amber**	**E3a PC Amber**	**E2 PC Amber**	**E1c NB Amber**	**E1b NB Amber (3)**	**E1a NB Amber (3)**
Total lumens (amber + non-amber / fully shielded + non-fully-shielded)	238,000	136,000	106,000	120,000	45,000	N/A
Limit on non-amber lighting sources	23,800	13,600	10,600	6,000	3,000	N/A
Limit on unshielded light sources, all allowable CCT per 402.1	8,000	6,600	2,700	2,700	2,700	N/A

COMMERCIAL OPTION 2 - MOSTLY 2200K CCT

OPTION 2 – MOSTLY 2200K CCT	LIGHTING AREA					
	E3	**E3a**	**E2**	**E1c**	**E1b**	**E1a**
Option 2A- Mostly 2200K CCT or warmer, all fully shielded (1,2)	**E3**	**E3a**	**E2**	**E1c**	**E1b (3)**	**E1a (3)**
Total lumens (2200K CCT + >2200K CCT) All lighting shall be fully shielded	250,000	150,000	62,000	N/A	N/A	N/A
Limit on light sources rated greater than 2200K CCT	50,000	30,000	12,400	N/A	N/A	N/A
Limit on unshielded light sources	0	0	0	0	0	0
Option 2B- Mostly 2200K CCT or warmer (1,2)	**E3**	**E3a**	**E2**	**E1c**	**E1b (3)**	**E1a (3)**
Total lumens	175,000	100,000	47,000	N/A	N/A	N/A
Limit on light sources rated greater than 2200K CCT	35,000	20,000	9,400	N/A	N/A	N/A
Limit on unshielded light sources	11,000	9,000	2,700	N/A	N/A	N/A

COMMERCIAL OPTION 3 - ALL ALLOWABLE CCT FULLY SHIELDED

OPTION 3	LIGHTING AREA					
	E3	**E3a**	**E2**	**E1c**	**E1b**	**E1a**
Option 3A- All allowable CCT fully shielded (1,2)	**E3**	**E3a**	**E2**	**E1c**	**E1b (3)**	**E1a (3)**
Total lumens – all lighting shall be fully shielded	160,000	96,000	40,000	28,000	25,000	12,500
Limit on unshielded light sources	0	0	0	0	0	0
Option 3B- All allowable CCT, mostly fully shielded (1,2)	**E3**	**E3a**	**E2**	**E1c**	**E1b (3)**	**E1a (3)**
Total lumens (Fully shielded + unshielded)	110,000	63,000	30,000	18,000	11,000	N/A
Limit on unshielded light sources	7,000	5,700	2,700	2,700	2,700	N/A

Meeting Notes: The below notes are presently unchanged except for the removal of those notes that are for residential lighting now existing as Table 401.2.

Notes to Table 401.1

1. Use any one of the three options, 1, 2, 3 for the developed area.
2. This refers to all land-use zoning classifications for multiple family uses including apartments and condos, commercial, and industrial sites.
3. In addition to the lumen caps given in the table above, the maximum illumination level under any canopy in Lighting Area E1a shall not exceed 30 lumens per square foot and in Lighting Area E1b shall not exceed 55 lumens per square foot of the canopy area.
4. Other than amber LED, light temperature maximum is 3000K.

TABLE 401.2 - RESIDENTIAL LIGHTING

Meeting Notes for Option 2: This option previously existed in the 2012 code but was offered as a footnote to the lumens cap table.

RESIDENTIAL OPTION 1 - ALL LIGHTING

	Lighting Area as Defined in Chapter 3					
All residential zoning (1)	**E3**	**E3a**	**E2**	**E1c**	**E1b(5)**	**E1a(5)**
Total (fully shielded plus unshielded)	55,000	39,000	24,000	15,000	12,000	12,000
Limit on unshielded component	11,000	9,000	2,700	2,700	2,700	0

RESIDENTIAL OPTION 2 - AMBER SOURCES

If at least 75% of the installed lumens are from Amber sources, then the total lumens in the table, for all areas, may be increased by 50% for the fully shielded component only.

	Lighting Areas as Defined in Chapter 3					
All residential zoning(1)	E3	**E3a**	**E2**	**E1c**	**E1b(2)**	**E1a(2)**
Total (fully shielded plus unshielded)	82,500	58,500	36,000	22,500	18,000	18,000
Limit on unshielded component	11,000	9,000	2,700	2,700	2,700	0

Notes to Table 401.2

1. This refers to all residential land-use zoning, such as single family detached and duplexes.
2. In addition to the lumen caps given in the table above, the maximum illumination level under any canopy in Lighting Area E1a shall not exceed 30 lumens per square foot and in Lighting Area E1b shall not exceed 55 lumens per square foot of the canopy area.
3. Other than amber LED, light temperature maximum is 3000K.

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SECTION 403

- **Section 403.4:** Minor revision Should refer out to section 701.4.

- **New section 403.5.3**

  Separate timer
  Whenever a curfew “off” time is required for this code, all outdoor lighting affected by the curfew shall be maintained on a timer separate from any lighting timers not programmed for this curfews.

  Note: Language modified to ensure reduction in skyglow but also to provide benefits to businesses and customers where shielded light needs to remain on but has traditionally turned off on the same timer as unshielded lights and signage.

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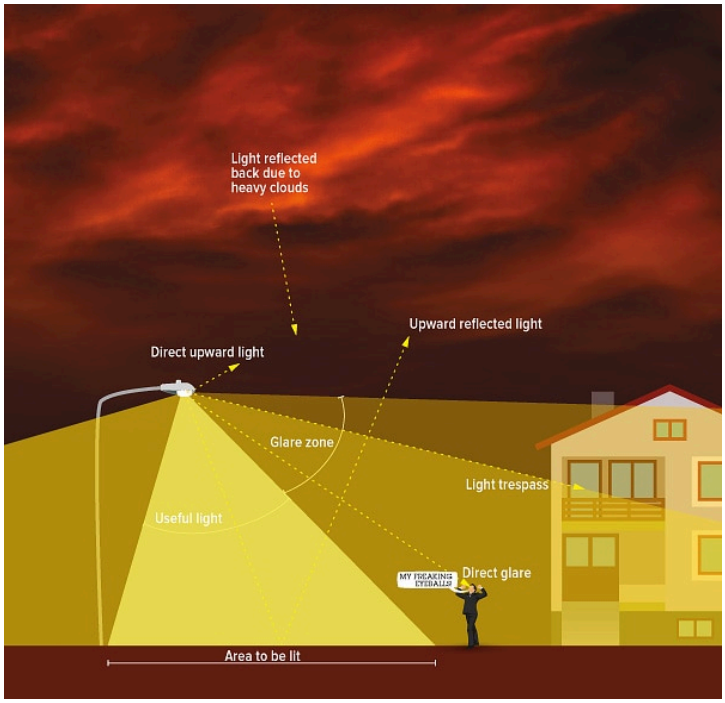
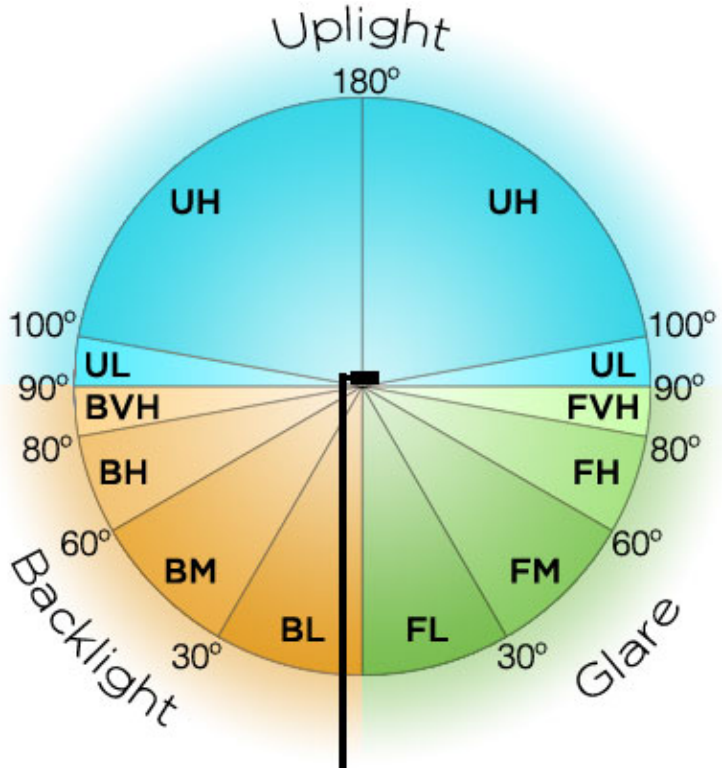
SECTION 701

- **Section 701.4:** Minor revision. Should refer back to section 403.5. (Presently refers to 403.4).

POTENTIALLY HELPFUL IMAGES AND DIAGRAMS FOR DISCUSSION

IES BUG: Backlight, Uplight, Glare





Backlight

(lumens)		B0	B1	B2	B3	B4	B5
Backlight	BH	110	500	1,000	2,500	5,000	>5,000
	BM	220	1,000	2,500	5,000	8,500	>8,500
	BL	110	500	1,000	2,500	5,000	>5,000

Uplight Ratings

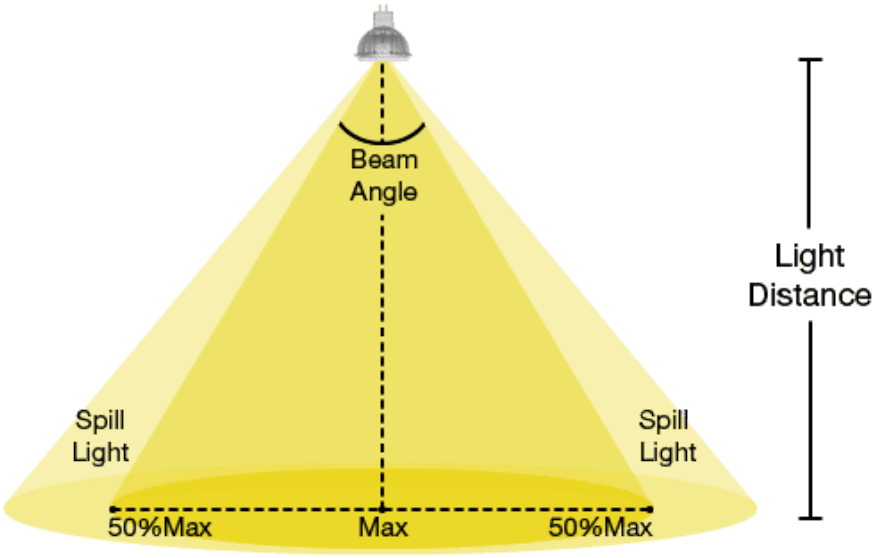
(lumens)		U0	U1	U2	U3	U4	U5
Uplight	UH	0	10	50	500	1,000	>1,000
	UL	0	10	50	500	1,000	>1,000

Glare Ratings for Asymmetrical Fixtures

(lumens)		G0	G1	G2	G3	G4	G5
Glare	FVH	10	100	225	500	750	>750
	BVH	10	100	225	500	750	>750
	FH	660	1,800	5,000	7,500	12,000	>12,000
	BH	110	500	1,000	2,500	5,000	>5,000

Glare Ratings for Quadrilateral Symmetrical Fixtures

(lumens)		G0	G1	G2	G3	G4	G5
Glare	FVH	10	100	225	500	750	>750
	BVH	10	100	225	500	750	>750
	FH	660	1,800	5,000	7,500	12,000	>12,000
	BH	660	1,800	5,000	7,500	12,000	>12,000


Beam
Angle
Light
Distance
Spill
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Spill
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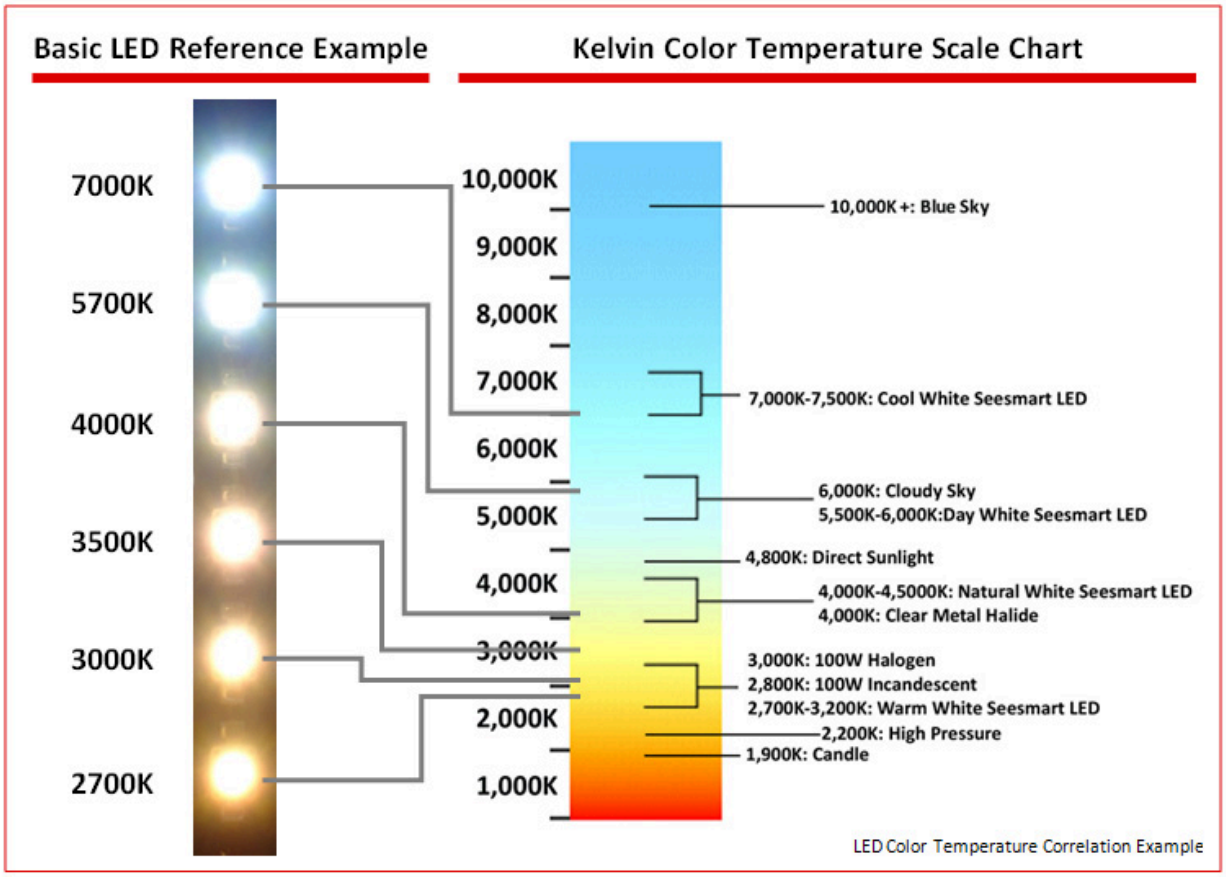
50%Max
Max
50%Max


Basic LED Reference Example
Kelvin Color Temperature Scale Chart
7000K
5700K
4000K
3500K
3000K
2700K
10,000K
9,000K
8,000K
7,000K
6,000K
5,000K
4,000K
3,000K
2,000K
1,000K
10,000K +: Blue Sky
7,000K-7,500K: Cool White Seesmart LED
6,000K: Cloudy Sky
5,500K-6,000K:Day White Seesmart LED
4,800K: Direct Sunlight
4,000K-4,5000K: Natural White Seesmart LED
4,000K: Clear Metal Halide
3,000K: 100W Halogen
2,800K: 100W Incandescent
2,700K-3,200K: Warm White Seesmart LED
2,200K: High Pressure
1,900K: Candle
LED Color Temperature Correlation Example