

Recessed Lighting

Also known as can lighting, recessed lighting is the most common form of architectural lighting. It's a multipurpose light source that can provide many lighting solutions.



A versatile light source, recessed lighting can be used both indoor and outdoor; damp and wet locations. It can be used for ambient lighting, task lighting, accent lighting and wall washes.

Housings

There are many different kinds of housings available. Choosing the right type for the job takes understanding of the customer's needs and the requirements for the job setting.

Step 1 **Housing Types**

New Construction housings are made for installation prior to drywall hanging in a new home.

Remodel housings are made to work in your existing ceiling during a room remodel.

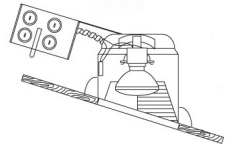
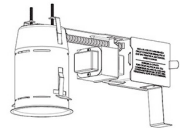
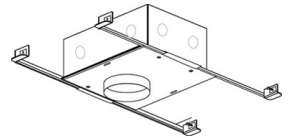
Sloped housings are made for sloped ceilings. Certain brands carry different ceiling pitch housings so attention to slope degree abilities are important.

Airtight housings minimize airflow and are energy efficient by preventing leaking air.

Step 2 **IC vs. Non-IC Rated**

IC Rated Housings are made for "Insulation contact" meaning that they allow for insulation to be right next to the can.

Non-IC Rated Housings must be installed more than 3" away from insulation.



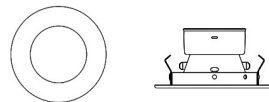
Aperatures & Trims

The housing type along with the trim combined make a complete downlight. Different combinations of aperatures and trim style can produce any desired light source.

Step 3 **Aperatures**

Aperature refers to the size of the opening, thus the size in inches when choosing a recessed downlight. 5-6" housings have been the standard for general ambient lighting for a long time. However, 3-4" housings are gaining in popularity.

Step 4 **Trims**



Trims are defined by their function.

Gimbal or 'adjustable' trims are used to highlight a feature or object in a room.

Pinhole trims are designed with a deep-set reflector and optimal glare control for highlighting objects.

Wet-rated or 'shower' trims are designed to keep the fixture safe from moisture and water.

Baffle trims diffuse light and also do so differently from color to color.

Reflector or 'alzak' trims bounce light and are used in places which require an extra punch of light.

Beam Spreads

In order to properly layout recessed lighting, you must understand how each downlight you choose will throw the light down to the floor. The trim and aperture size will also affect the way the light falls.

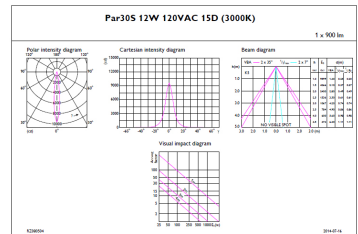
Step 5 **Photometrics**

Any LED lamp, or retrofit trim will have some kind of photometric data which will show you the beam spread of the light source at different heights.

When for factor in the height of the ceiling and the beam spread, this will help you plan for spacing of the downlights.

Step 6 **Placement Types**

Each type of downlight has different layout formulations. Wall washes are meant to wash the wall and therefore must be a certain distance away to do so, while ambient downlights must be placed a certain distance from one another so they do not cast shadows.

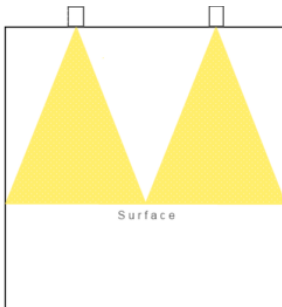


Downlight Placement

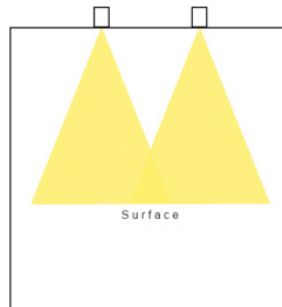
A general rule of thumb for ambient lighting is to space the cans based on the height of the ceiling. You should also space them twice as wide from each other as they are from the wall.

On an 8 foot ceiling, place the cans approximately 4 feet apart. To find this height, you take the height of the ceiling and divide by 2. So an 8 foot ceiling, space them 4 feet apart; a 10 foot ceiling, space them 5 feet apart.

By doing this, the beam spreads light the room evenly and does not overlap. The images below show the difference.



Correct Spacing
Beam spreads meet
at the floor



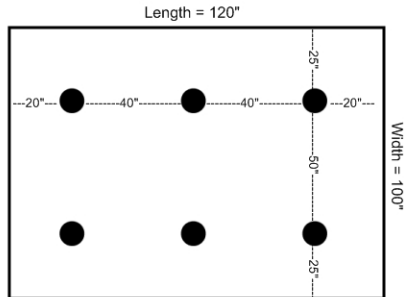
Incorrect Spacing
Beam spreads
overlap

Ambient Downlight

Step 7 **Ambient Light Placement**

Start with a rough concept of where to place the downlights on a simple illustration with length and width measurements. To decide how to place them around objects like a ceiling fan.

When spacing the downlights, the distance between the lights should always be double what it is at the ends. For example, the width of the room illustrated below, the space on either end, 25" is half the space between the downlights, 50."



Divide the length of the area by two to get the distance between the lights. For example, $100" / 2 = 50"$ between downlights.

Then divide that number by two to find how far from the wall the outer downlights should be placed. For example $50" / 2 = 25."$ Then do the same for the width of the room.

Downlight Placement

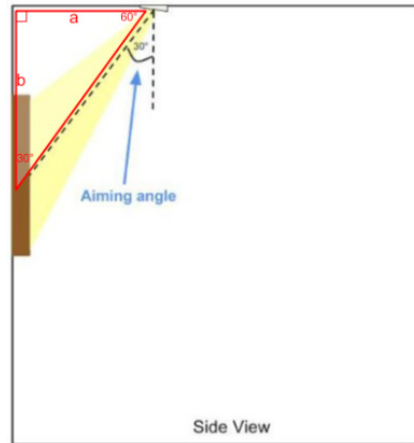
Step 8 **Accent Light Placement**

Start with a concept of where to place the accent downlights and in a rough illustration.

The idea is that the wall, ceiling and the accent light form a right triangle. This triangle is known as a 30°-60°-90° right triangle.

Since we know the angles, we need to determine the measurements which will help us solve for side a, the distance of the downlight from the wall to achieve the desired 60° angle.

First measure the distance of side b, which is the distance from the center of the focus, like a piece of art, to the ceiling.



The formula to find a, or the distance from the wall to the placement of the downlight is $a = (b \times \sqrt{3}) / 3$. To make it more simple, the $\sqrt{3}$ is 1.73 so we will change the equation to $a = (b \times 1.73) / 3$

Accent Downlight

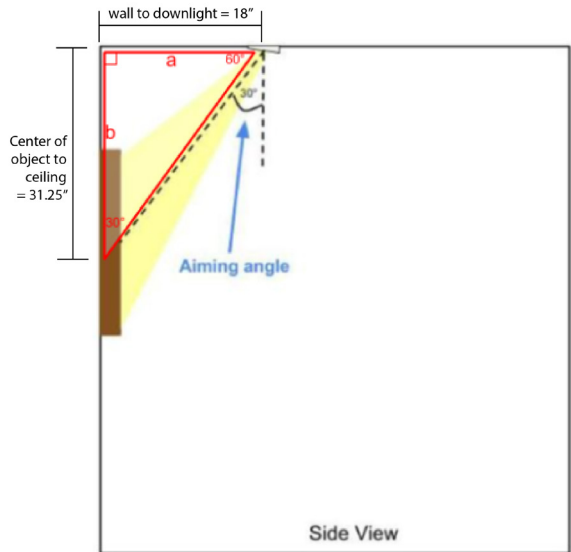
Say we measured b , and it was 31.25." So we plug in 31.25 for b in the equation:

$$a = (31.25 \times 1.73) / 3$$

$$a = 54.07 / 3$$

$$a = 18.03$$

So we need to place the downlight approximately 18" from the wall.



This equation is based on the idea that the perfect angle to prevent glare is 30° so we will angle the downlight to this angle. Most downlights can angle up to around 35° so this leaves a little wiggle room.