



LiElectro

Flash You Need



QUICK GUIDE

How Long Do LED Lights Last?

Lifespan by light type, in hours and in real years.

A 4-page cheat sheet with the numbers that matter.

Lifespan by light type

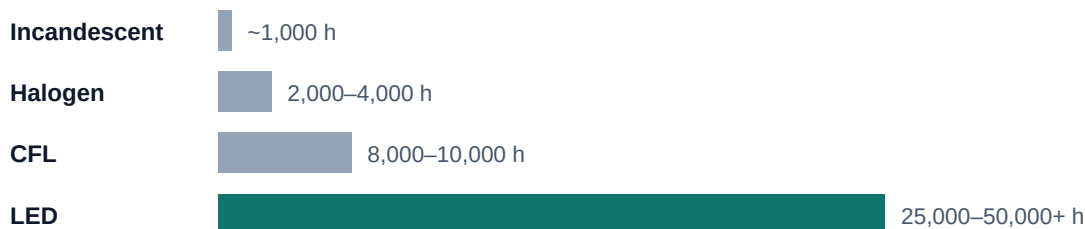
Rated life is the number on the box. The years column shows what that means at a realistic daily use. Ranges are typical for good-quality products; cheap ones land lower.

Type	Rated life (hours)	Years at daily use	Main thing that cuts it short
Household LED bulb	15,000–25,000	14–23 years at 3 h/day	Enclosed fixtures trap heat
Ceiling, flush mount, downlight	25,000–50,000	14–27 years at 5 h/day	Driver often dies before the LEDs
LED strip	25,000–50,000	17–34 years at 4 h/day	Poor heat sinking, cheap power supply
Outdoor floodlight	30,000–50,000	8–14 years at 10 h/day	Water ingress, power surges
Pool light	30,000–50,000	14–23 years at 6 h/day	Seal failure, water chemistry
Commercial high bay	50,000–100,000	11–23 years at 12 h/day	Hot warehouses, driver stress
LED Christmas lights	10,000–25,000	33–83 years at 300 h per season	Wires and connectors give up first

Years = rated hours / (daily hours × 365). Real-world life is shorter when heat, voltage or moisture are a problem.

LED vs the old stuff

Typical rated life in hours, based on U.S. Department of Energy figures for incandescent and CFL, plus common ranges for halogen and LED.



Years at 3 hours a day

Technology	Rated hours	Lasts about
Incandescent	1,000	0.9 years
Halogen	2,000–4,000	1.8–3.7 years
CFL	8,000–10,000	7.3–9.1 years
LED	25,000–50,000	23–46 years

How lifespan is really measured

An LED rarely dies. It fades. That changes how you read every number on a package.

L70 = the hour count when light output drops to 70% of brand new.

A bulb rated 25,000 hours is not expected to go dark at 25,000. It's expected to be noticeably dimmer, and that's when the rating says it's done.

Decoding the spec sheet

Term	What it means
L70 / L80 / L90	Hours until output falls to 70%, 80% or 90% of the original. Higher L number means less fading at the same hours.
B10 / B50	The share of units allowed to miss that L target. L70 B50 at 50,000 h means half the batch is at or below 70% light by then.
LM-80	Lab test on the LED chips, typically logged at 3,000, 6,000 and 10,000 hours.
TM-21	The method used to project LM-80 data out to a full lifetime. Projections are capped at 6x the test length.

Numbers worth knowing

- **30,000–50,000+ hours:** what the U.S. Department of Energy says to expect from a good-quality white LED product.
- **25,000 hours:** the minimum in-fixture L70 that ENERGY STAR requires for qualifying downlights.
- **5.7 years:** how long 50,000 hours lasts if the light never switches off (there are 8,760 hours in a year).
- **At least 75% less energy** than incandescent for ENERGY STAR certified LEDs.
- **48%:** share of U.S. residential lighting that was LED in DOE's 2020 market characterization, the newest full DOE stock survey I could find.
- **1.3 quads and \$14.7 billion:** annual U.S. energy and cost savings from LED adoption in 2018, per DOE. About 5% of building electricity use.

Watch the big claims

A 100,000-hour rating is possible, but it needs a very long LM-80 test behind it. If a listing shows a huge number and no L70 value or test basis, treat it as marketing. Ask what it's based on.

Make them last, and know when to swap

Heat is the main enemy. Almost everything else is a version of heat, moisture or bad power.

What shortens life	What to do about it
Heat in enclosed fixtures	Use bulbs marked enclosed-rated. Keep vents and heat sinks dust-free.
Voltage spikes and unstable supply	Add surge protection. Use a proper driver, not a random adapter.
Cheap drivers and power supplies	The driver is usually the first part to fail. Buy fixtures with a listed driver and a real warranty.
Dimmer mismatch	Match the dimmer to LED loads. Flicker and buzzing wear parts down.
Moisture	Check the IP rating. Outdoors, look for IP65 or higher. Submerged pool lights need IP68.
Long strips on thin, hot surfaces	Mount strips in aluminum channels so heat has somewhere to go.

Signs it's time to replace

- **Dimmer than it used to be.** Around 70% of original light is the standard end-of-life mark.
- **Flicker or buzzing.** Usually the driver, not the LEDs.
- **Color shift.** White turning pink or green, or RGB colors drifting.
- **Uneven output.** Some chips on a strip or panel dying off first.

Buying checklist

- 1 Look for ENERGY STAR or DLC listing.
- 2 Find a published L70 hour count, not just "long life."
- 3 Prefer a warranty of 3 years or more.
- 4 Match the rating to the spot: enclosed, damp, wet or submersible.

Sources

U.S. Department of Energy, Solid-State Lighting Program (LED basics, LED adoption report, 2020 lighting market characterization); ENERGY STAR downlight criteria and lumen maintenance guidance; IES LM-80 and TM-21 methods. Ranges for halogen, strips, pool, outdoor and commercial fixtures are typical manufacturer-rated values and vary by product. Always check the spec sheet for the exact item.