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🗣️ EN · العربية

PRACTICAL LIGHTING KNOWLEDGE

Beam Optics

Lens vs reflector, beam angles, and how the optic — not the LED — decides where light lands.

Same LED, **different beam?**

Yes. The optic in front of the chip shapes the light. Change the lens or reflector and the same source becomes a floodlight or a spotlight.

DEFINITION · 1 OF 2

Lens

Shapes light by **refraction**.



TIR / PMMA optics. **Tight, precise beams** — great for accent and high mounting.

DEFINITION · 2 OF 2

Reflector

Shapes light by **reflection**.



Faceted or specular bowl. **Efficient, smooth spread** — great for general and wall-wash.

THE RELATIONSHIP

Beam° ↓ **Intensity**
↑ (cd at center)

Narrow the beam and the same lumens concentrate — center-beam candlepower rises while coverage shrinks.

One source. Three beams.

Beam angle by application (illustrative bands).

NARROW

Accent, high bay

<15

◦

MEDIUM

General downlight

24–
40

◦

WIDE

Wall-wash, area

>60

◦

Beam angles you can screenshot.

Typical optic choices by task. Confirm with the photometric file.

Accent / spot

10–20°

Retail downlight

24–36°

Office / general

60°

Wall-wash

asym optic

Flood / area

90–120°



Picking the fixture, ignoring the optic.

Two fixtures with the same lumens can light a space completely differently. **The beam angle and optic** decide glare, uniformity, and where the light actually goes.

NEXT TIME YOU SELECT A FIXTURE

Spec the **beam**, not **just lumens.**

Ask for the optic type and beam angle, then verify on the .ies file.

- ✓ Optic: lens (TIR) or reflector
- ✓ Beam angle for the task
- ✓ Photometric (.ies / .ldt) file

PRACTICAL LIGHTING KNOWLEDGE

Save this. Send it to a colleague.



NEXT EPISODE

Choosing the Right Reflector

→ nlc.com.sa/academy