

🕒 120 seconds

📺 EN · العربية

HOW AN LED BOARD IS MADE

Paste to *light.*

The four-step SMT line that turns a bare PCB into a finished LED module, and the QA gates that catch the failures.

Where do most LED boards **actually** fail?

Not in the chip. At the very first station. Industry data puts around 64% of SMT defects at solder paste printing, before a single component is placed.

DEFINITION · 1 OF 2

SMT

Components sit **on the surface**. Not in drilled holes.



Surface-Mount Technology vs **through-hole**.
Faster, denser, automatable, unforgiving of paste defects.

DEFINITION · 2 OF 2

Paste vs Reflow

A stencil **prints paste**. The oven **melts it into joints**.



Paste is grey clay on the pads.
Reflow turns it into **solid solder joints**.



THE REFLOW PROFILE

Preheat → Soak

→ reflow peak → cooldown

Reflow is a temperature curve, not a single heat. The peak is tuned to the paste alloy: SAC305 lands near 245 °C. Wrong curve, and you get cold joints or chip damage.

Four steps. Three to remember.

Print, place, reflow, inspect. If you carry only three numbers into your next spec call, make it these.

TAKEAWAY 1

**Paste is the top
defect source**

~64

% OF FAILS

TAKEAWAY 2

**Reflow is a curve,
tuned to the alloy**

245

°C PEAK

TAKEAWAY 3

**AOI scans every
joint, every board**

0

CRITICALS

Numbers worth memorising.

Typical targets for fine-pitch LED boards. Your numbers depend on board size and pick count.

SAC305 reflow peak temperature

245 °C

Solder paste inspection volume

±10 %

Pick & place rotation tolerance

<5 °

X-ray BGA void content limit

<25 %

Functional test, lumen and CCT

±5% / ±100 K



The common misconception.

That a board passing AOI means it was built right. Optical inspection cannot see **under a BGA or a large MOSFET**. Those hidden joints need **X-ray**, and catching a defect late costs 5 to 10 times more than catching it at the paste stage.

NEXT TIME YOU SPEC A MANUFACTURER

Ask what the line actually runs.

Not just a price per board. Ask for the inspection coverage and the audit trail. If they cannot share it, that is the answer.

- ✓ SPI and full AOI on every board
- ✓ Reel-level traceability per board
- ✓ IPC class declared for the build



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