

Soldering — take-home notes

Keep this by the bench

WHEN IT WON'T STICK, CHECK IN THIS ORDER Dirty › Cold › Oxidized tip › No flux left › Not enough time

The move, five counts

- 1 **Touch both.** Tip contacts the pad and the lead at the same time.
- 2 **Count one.** Let the heat get into the metal.
- 3 **Feed the far side.** Solder goes into the joint, opposite the iron. If it won't melt there, the joint isn't hot enough yet.
- 4 **Watch it flow.** It runs around the lead and forms a fillet.
- 5 **Solder away, then iron away.** In that order. Hold still while it sets.

Two to three seconds for a small through-hole joint. Longer than that and you're cooking the pad.

Reading a joint



Good

Shiny, smooth, concave. Wets the pad and the lead both.



Cold

Dull and grainy. Not enough heat. Add flux and reheat.



Starved

No fillet, lead barely wetted. Needs more solder.



Excessive

A ball that hides the joint. You can't inspect it.



Bridge

Two pins joined. Wick it out, don't chase it around.



Disturbed

Moved while cooling. Cracked inside. Reheat it.

A joint that looks fine but pulls out was never wetted. Tug-test a few.

Look after the tip

- **Tin it before first use** — melt solder over the whole working face.
- **Wipe, then re-tin** — every time, before it goes back in the stand.
- **Leave it tinned at shutdown**, not clean.
- **Black and crusty?** Tip tinner and fresh solder. If it still won't take, replace it.

650–750 °F / 340–400 °C is a place to start with leaded solder, not a rule. Watch the joint, not the number — and remember the dial never fixes an oxidized tip or a joint with no flux left.

Buy this next

- **A temperature-controlled station.** The single biggest jump in results.
- **A chisel tip.** More contact area than the conical tip in the box.
- **A flux pen.** The cheapest upgrade in the hobby.

What's on the spool

63 / 37 tin-lead 361 °F [START HERE](#)

Eutectic — liquid straight to solid, no mushy stage. The most forgiving thing to learn on.

60 / 40 tin-lead 361–374 °F

A narrow plastic range where it's neither. Move the joint in that window and it sets cracked.

Lead-free SAC305 423 °F

Hotter, wets less willingly, dries dull. That dull look is normal here — don't read it as a cold joint. Judge shape and wetting instead of shine.

Diameter matters: 0.6–0.8 mm for board work. Thick solder is how pads get flooded.

Flux

• Rosin (R, RMA, RA)

Pine resin — this is what's inside most cored solder. Sticky amber residue; isopropyl removes it.

• No-clean

Milder. Small clear residue that's fine to leave on the board for hobby work.

• Water-soluble

Fast and aggressive. Must be washed off completely, or the residue corrodes the joint it just made.

• Acid core / plumbing

For copper pipe. It keeps eating your board long after the joint is cold. Never on electronics.

Cored solder carries its own flux, metered for one quick joint. Add a **flux pen or paste** anywhere the job runs longer than that — rework, ground-plane pads, wicking braid. A fillet that stops halfway usually means the flux ran out.

Read further

- **PACE Basic Soldering Lessons 1–9** and **Rework & Repair 1–8** — free at paceworldwide.com and on their YouTube channel. Old, thorough, still the best free course there is.

- **IPC-A-610** — the industry acceptability standard. What "good" officially means.

- Mine:

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Every joint you made today, you made yourself. Go break something and fix it.

Questions later? Find me in the space.