



EAA 1445

Soldering

Scott Todd 3/15/25

Background

- AS in Electronics Technology - 1980
- BSE Aerospace – 1988
- MS Mechanical Engineering 1995
- Army trained to solder 1978
- NASA trained and certified 'Basic Soldering' 1984
- FAA Repairmen (A&P for Homebuilts) x3
- Life long Modeler - Hobby Shop

Non-Aviation Hobbies

- Repair and Restore Vintage Pinball Machines
- Repair Vintage Computers (Commodore, Atari, etc)
- Repair and restore Vintage R/C transmitters
- General Electronics tinkering

Definitions

Soldering is a process of joining two metal surfaces together using a filler metal called solder. The solder has a lower melting temperature than the base metal to be soldered.

Basically 3 types

Soft – commonly uses Tin and Lead < 750 F

Silver soldering - uses an alloy containing silver > 1100F

Brazing - uses a brass alloy for the filler

Flux – Used to facilitate the soldering process. Water based, no-clean, traditional acid based. Usually included in modern solder (1%-3% typical). External flux for difficult situations. Helps with 'wetting' and heat transfer. Can be corrosive.

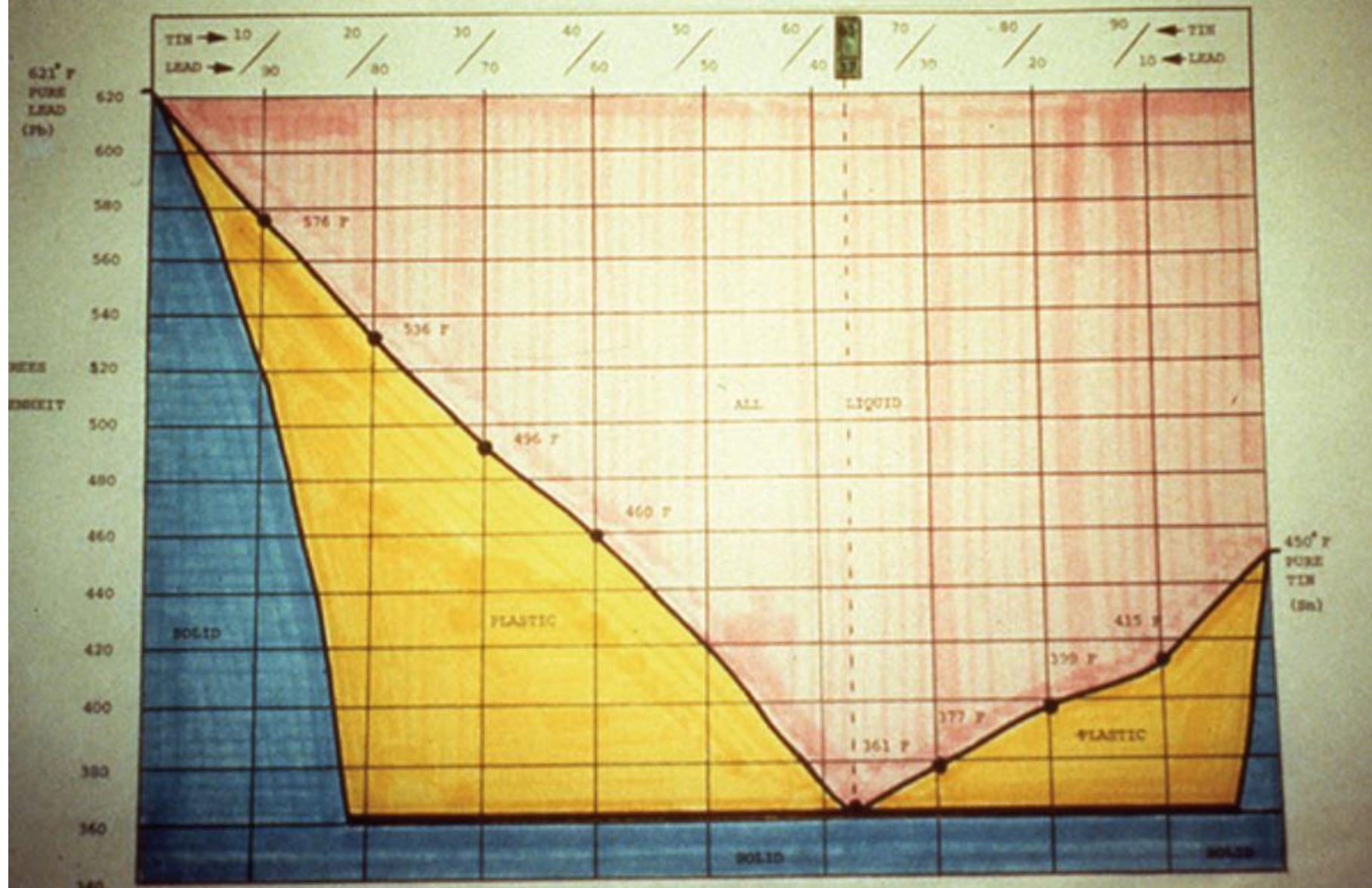
Solder Types

- Most electronics solder is 63% tin, 37% lead
- 63/37 melts at 361F exactly
- 60/40 melts at 361-375F - Old School
- Lead Free – more sensitive, harder to flow, harder on iron tips. Mostly banned worldwide in manufacturing.

- Sn63Pb37 **245** 0.031 0.80 **50 1.1%** Leaded Contains Halogen Sn63Pb37 1.1%/245 .031 1 LB SPL 24-6337-8800 No-Clean

- Sn63Pb37 **331** 0.031 0.80 **66 3.3%** Leaded Contains Halogen Sn63Pb37 3.3%/331 .031 1 Lb SPL 24-6337-6403 Water-Soluble Minimal smoke and odor

TIN-LEAD FUSION DIAGRAM



Soldering Tools

Overall Pick 



Soldering Iron Kit, 80W 110V LCD Digital Solder Iron Pen with Ceramic Heater, Portable Welding Tools with 5pcs Tips, Stand,...

★★★★☆  4,573

8K+ bought in past month

\$9⁹⁹ List: \$12.99

Best Seller



Sponsored 

YIHUA 926 III 60W Digital Display Soldering Iron Station Kit w 2 Helping Hands, 6 Extra Iron Tips, Lead-Free Solder, Solder Sucker...

★★★★☆  6,026

2K+ bought in past month

\$42⁹⁹ List: \$59.99



Sponsored 

LRT 858D Digital Hot Air Rework Station for SMD Soldering

★★★★☆  208

200+ bought in past month

\$39⁹⁹

TIP TEMPERATURE

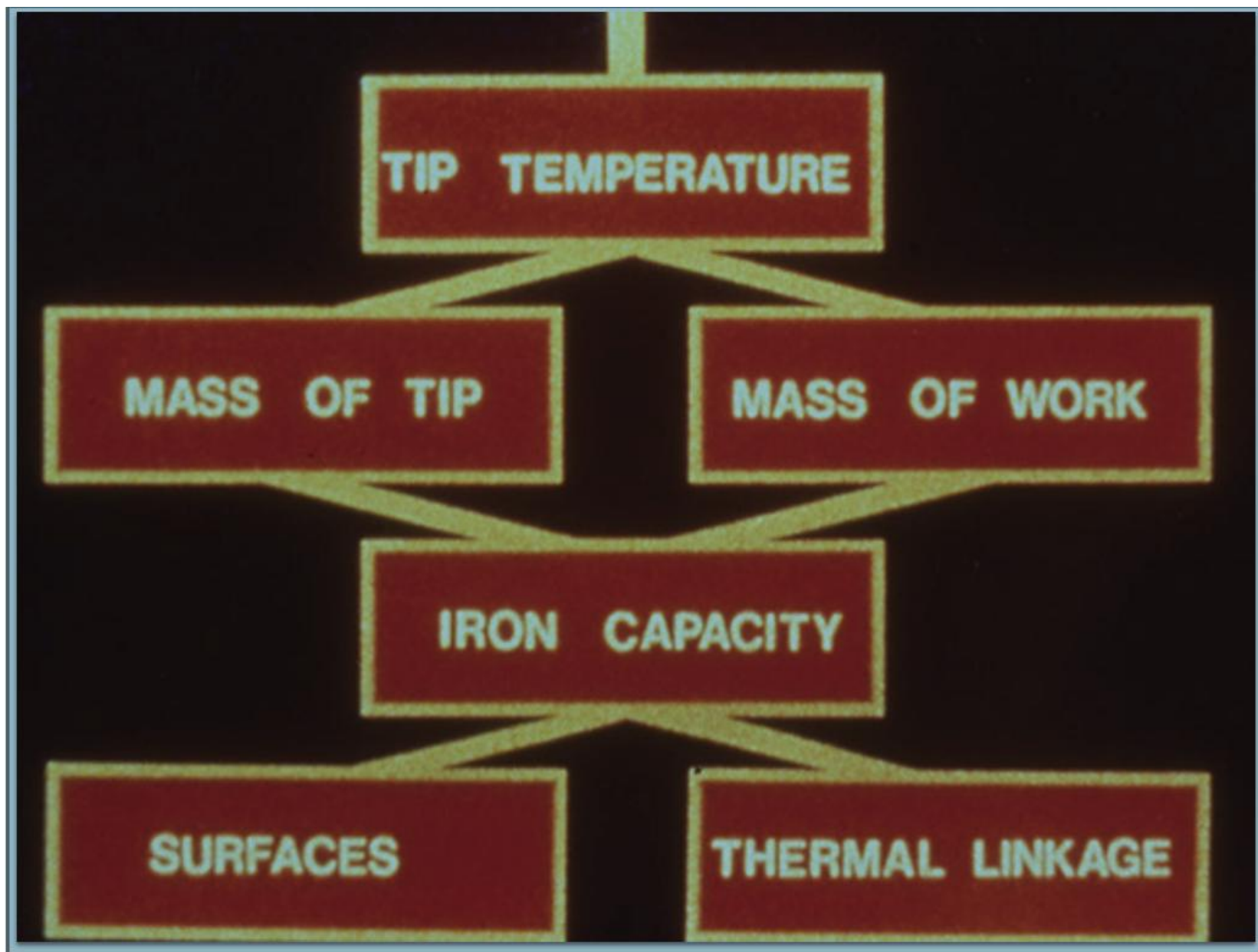
MASS OF TIP

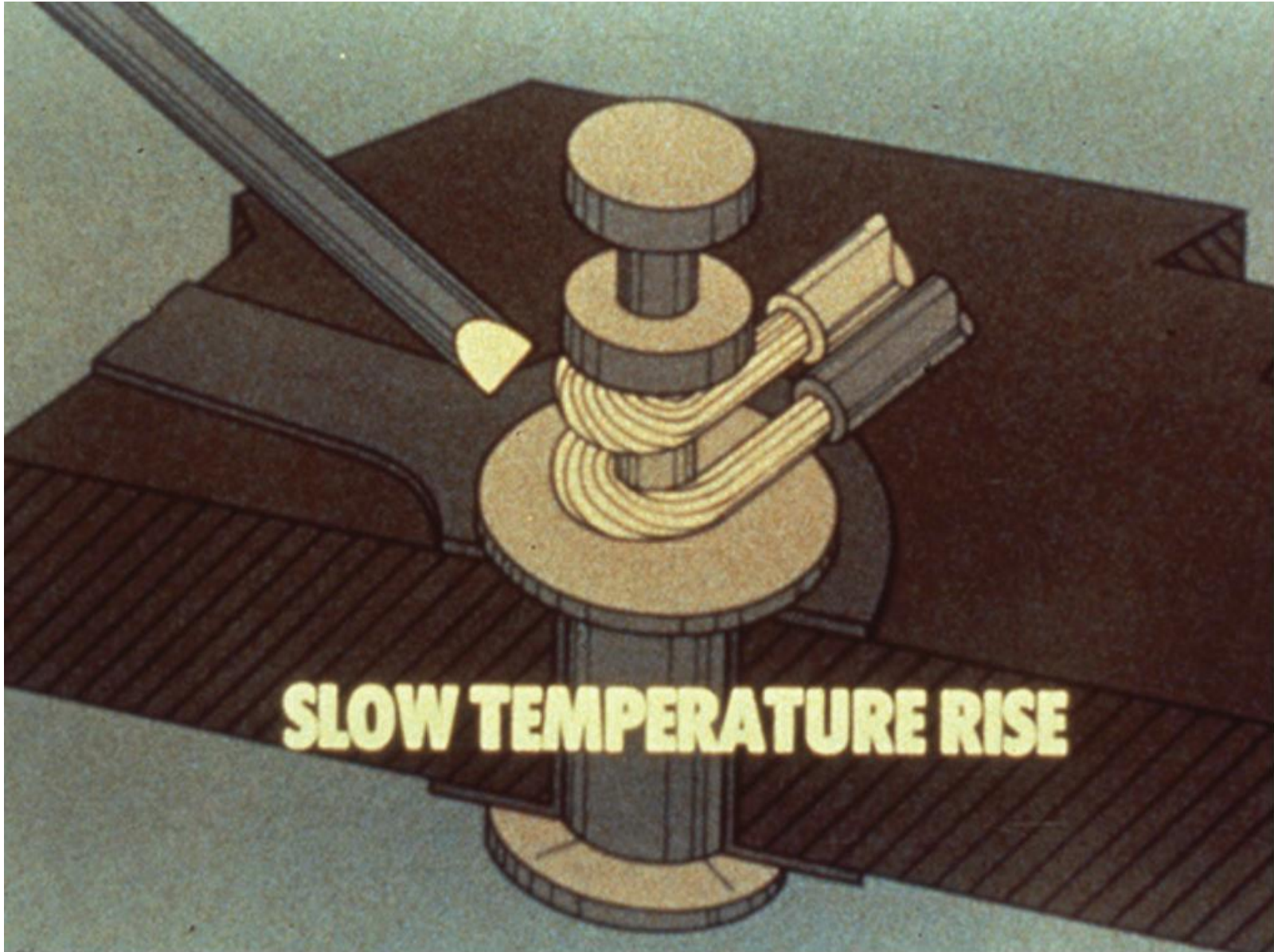
MASS OF WORK

IRON CAPACITY

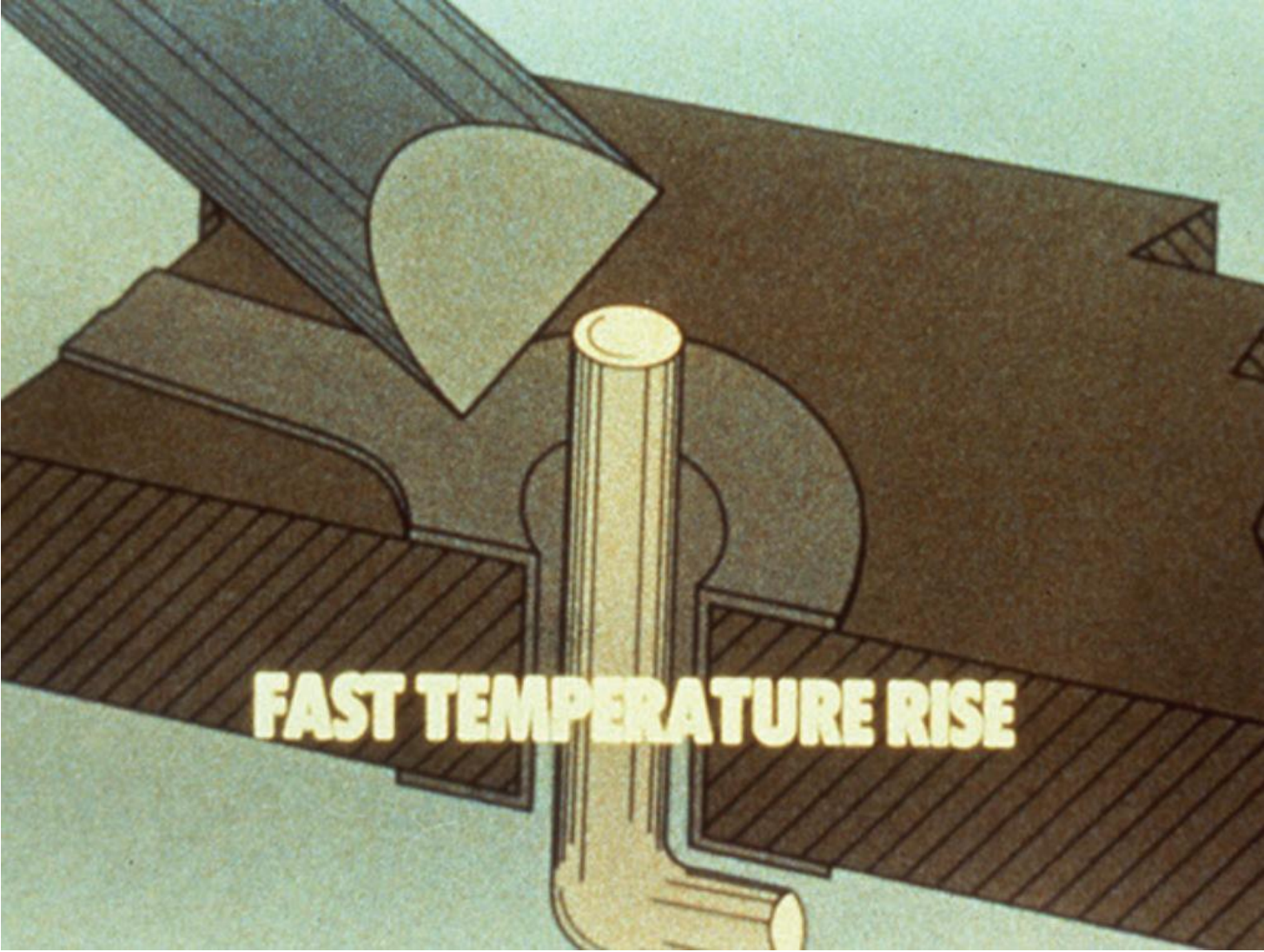
SURFACES

THERMAL LINKAGE





SLOW TEMPERATURE RISE



FAST TEMPERATURE RISE

Soldering Tools



Kester
24-6337-8800 50 Activated Rosin
Cored Wire Solder Roll, 245 No-
Clean, 63/37 Alloy, 0.031"
Diameter

★★★★★ v 922

200+ bought in past month

\$32⁷⁴ Typical: \$39.99



Kester
44 Solder Wire, 63/37 0.031",
RMA Rosin, 1-ounce Tube

★★★★★ v 545

700+ bought in past month

\$12⁶³



**Liquid Solder Flux Dropper (30
ml/1 Oz.) | RMA Liquid Solder
Flux | Soldering Flux | Electrical
Solder | No Clean Liquid Flux I...**

★★★★★ v 581

8K+ bought in past month

\$6⁹⁹

Soldering Tools



Sponsored ⓘ

solder wick braid 10ft Length
Desoldering Wick Braid Remover
Tool Solder Sucker 1 piece No-
Clean soldering Wick Wire Roll...

#1 Top Rated

★★★★☆ 5,739

5K+ bought in past month

\$7⁹⁹ List: \$9.99



Sponsored ⓘ

Solder Sucker No Clog
Desoldering Pump for Solder
Removing with Replaceable Heat
Resistan Silicone Sucking Nozzl...

★★★★☆ 165

400+ bought in past month

\$9⁹⁹



Hakko FR301-03/P Portable
Desoldering Tool with Precise
Temperature Control °F /°C

★★★★☆ 1,200

100+ bought in past month

\$331⁶⁴

3 Most Important points

- Clean and tin the tip
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- EVERY time you pick it up, CLEAN the iron tip!
 - EVERY time you pick it up, Tin the iron tip!

Proper Soldering

- Mechanically secure components/joint
- Clean and tin the iron tip
- Heat the components evenly (3 second rule)
- Flow the solder between the components/joint evenly
- Keep parts still while cooling/solidifying

