Solder

What kind of solder should you use?

If you live in one of the countries requiring adherence to the Restriction of Hazardous Substances Directive (“RoHS” pronounced roe-hass here in the States), you should buy non-lead solder. RoHS compliant solder requires higher temperatures to melt, so you'll need to get a hotter soldering iron and be careful to not overheat sensitive components. It's a good idea to buy sockets for as many components as you can to avoid heat-related damage. Since we've seen tin whiskers develop on RoHS compliant devices, it may be a good idea to periodically examine your solder joints under a microscope and reflow them as necessary.

As you can see from the following chart, solder prices are rising. The days are probably numbered for those of us using lead-containing solder, so it's probably a good idea to stock up.

What about flux?

Flux is very important in soldering. Flux removes oxidation and helps with solder “wetting”. There are two basic kinds of flux in soldering - organic and rosin core. Additionally, rosin core may be available in a “no-clean” formula. What really separates the different kinds of flux is how strong they are at removing oxidation - organic core solder is the most powerful, followed by RA rosin core, then RMA rosin core, followed by no-clean. Since I have personal projects that may sit around for a long time while I'm building or fixing things for other people, I prefer organic core since it is much better at removing any oxidation buildup. Because of the strength of organic flux, it is imperative that it be washed completely off of all components so that they don't corrode. Luckily though, organic core solder is water soluble, so it is easy to wash off this flux with water and a small brush. WARNING: It is not a good idea to use organic solder on stranded wire or other components where the flux may wick into the part and not be flushed out during the cleaning process.

No-clean solder is nearly inert, so it is not necessary to remove it. (Some companies still require that it be removed just to be safe.) No-clean is used on stranded wire, non-sealed potentiometers, and similar parts after organic core solder has been used on other components and completely washed off.

Many people use rosin core solder for everything in order to keep things simple and avoid confusion. While some people say you don't have to clean rosin core, it is probably a good idea to get rid of it anyway to avoid any long term problems. If you don't want to clean rosin core, it's probably better to get the RMA (Rosin Mildly Activated) version instead of RA (Rosin Activated).

What size?

Typically, the smaller the diameter the solder is, the higher the cost. I use .031“ solder for general use and .020” solder for surface mount projects since the pins are closer together. For very small surface mount items, you might want to to get .015“ or even .010” solder, but since a lot of SMD soldering techniques involve melting solder onto the iron and delivering it to the part, it may not be worth spending the extra money for the smaller diameters.

See Curious Inventor Surface Mount Soldering Video for an introduction to these techniques.

Solder Price Survey

March 22, 2008 - oy vey! What is up with solder prices??? I just started to buy some solder from Mouser, but they want $54 dollars for it!!! OK, let's compare prices on 1 pound spools... (Mouser fans, prepare for disappointment - in particular check out the 6403 and 8817....)

March 23, 2008 - we have a new winner! Check out the Techni-Tools guys... (And their Weller soldering iron tips are on sale too...)

April 6, 2008 - prices are still going up a bit. I've added another column on the right to indicate how much the Techni Tool price has changed this month.

Kester #331 Water Soluble 63/37 Organic Core (24-6337-64xx)

Type	Size	Digikey	Mouser	Jameco	Techni-Tool	
6422	.015	$47.13	$52.76	-	$31.89	+.28
6401	.020	$40.25	$45.33	-	$22.14	+.28
6417	.025	$30.23	$39.42	-	$21.56	+.45
6403	.031	$28.50	$54.09	$23.69	$16.89	+.28
6411	.062	$24.63	$28.49	-	-	-

Kester #245 63/37 No Clean 1.1% flux (24-6337-88xx)

Type	Size	Digikey	Mouser	Techni-Tool	
8806	.015	$47.13	$55.72	$28.89	+.28
8807	.020	$40.25	$45.33	$22.14	+.28
8809	.025	$30.23	$34.56	$19.59	+.28
8800	.031	$29.13	$33.32	$17.06	+.45
8813	.040	$27.63	$31.73	-	
8814	.050	$25.38	$29.30	-	
8817	.062	$24.63	$47.62	-	

Kester #44 63/37 RA Rosin Core (24-6337-00xx)

Type	Size	Digikey	Mouser	Jameco	Techni-Tool	
0001	.010	-	-	-	$99.62	
0007	.015	$47.13	$52.77	-	$28.89	+.28
0010	.020	$40.25	$45.33	-	$22.14	+.28
0018	.025	$30.23	$34.56	-	$19.59	+.28
0027	.031	$29.13	$35.80	$18.99	$18.39	+.28
0039	.040	$27.63	$31.73	-	-	
0053	.050	$25.38	$29.30	-	-	
0061	.062	$24.63	$28.49	-	$18.39	+.28

Kester #285 63/37 RMA Rosin Core (24-6337-97xx)

Type	Size	Techni-Tool
9703	.015	$28.89
9702	.020	$22.14
9718	.025	$19.59
9710	.031	$18.39

NOTE: New listing as of April.

If you've got a Fry's Electronics near you, check out their prices on solder - no Kester, but the prices are pretty decent!

Sources I've Used So Far

Digikey

Fry's Electronics

Jameco

Mouser

Techni-Tool

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