

FLUXES FOR LEAD-FREE SOLDERS

The roles of flux are cleaning oxides and other impurities from the surfaces to be soldered, and introducing the proper impurities to break down the intermolecular bonds in the solder. As the soldering process takes longer with lead-free alloys, the fluxes used must not only be more active chemically than fluxes applicable to tin/lead soldering, but they must last longer under the higher temperatures required. Fluxes, specially the popular 'no-clean' type used with tin-lead solder may not remain active long enough to allow for the slower wetting of lead-free alloys, or hold up under and the higher temperatures normally associated with lead-free solders. Fluxes specifically formulated for lead-free soldering incorporate more active chemicals and include heat-stable gelling and wetting agents to reduce the probability of solder defects.

It is claimed that no-clean lead-free solder fluxes leave minimum residues when compared to their tin/lead counterparts. While these fluxes do enhance the soldering process, the residues left on the product after soldering are harder to remove, so a more chemically active cleaning process is required. Reformulated RMA fluxes, which withstand the temperatures and dwell times involved in lead-free soldering, are being considered for these applications, although they do leave a residue.