

Reflow Profiling Guide

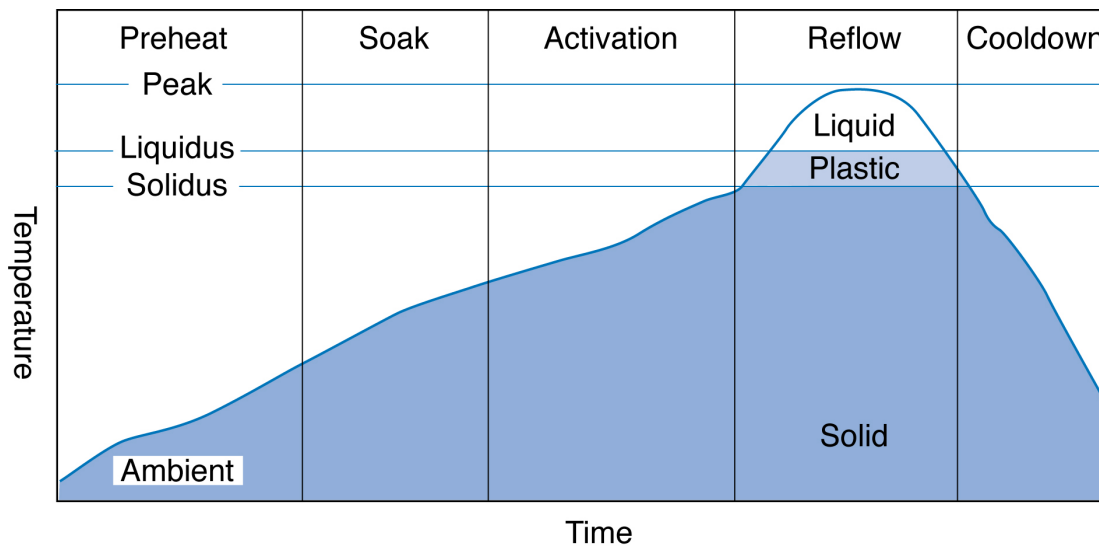
Introduction

EFD solder pastes produce high quality solder joints across a wide heating process range. As a rule, the shorter the profile, the better the solder paste will perform. There is no advantage to a “middle of the road” profile centered on the ranges given here.

The soldering process involves four separate inputs (two surfaces, solder paste, and heat source); therefore, no single temperature profile is ideal for all products and heating methods. A good profile will meet or exceed the minimum times at the coolest spot on the product while not exceeding the maximum times at the hottest point on the product.

Because of the variability of soldered devices and reflow equipment, it may be necessary to deviate from the suggestions given here. In such cases, we recommend you contact Technical Support at 800-338-4353.

Reflow Process



Preheat: Duration: 45 to 90 seconds. During preheat, low boiling point solvents and moisture are evaporated slowly to prevent spattering. Temperature ramps up from ambient (around 23°C) to 110°C at between ½° and 2°C per second.

Soak: Duration: 20 to 90 seconds. The soak stage is used to stabilize temperature across the entire product and continue evaporation of low boiling point materials. Small and thermally uniform parts do not need much soak, while boards with large components may require over a minute. Temperature ramps up from 110°C to 140°C at between ½° and 3°C per second.

Activation: Duration: 10 to 90 seconds for alloys with solidus under 250°C but may take up to 120 seconds for alloys with a higher solidus on thermally challenging products. The flux transitions from a gel state to a fluid state, then cleans the surfaces to be soldered. Excessive time in the activation range will use up available flux activity and may result in non-wetting, de-wetting, and related solder defects. Temperature ramps up from 140°C to the alloy solidus at between ½° and 3°C per second.

Reflow: Duration: 25 to 90 seconds for most alloys. Soldering begins upon reaching the solidus temperature of the alloy being used. For maximum joint strength, a peak temperature of 20° to 40°C above the liquidus must be reached. Rapid cooling can cause stress-related damage. Temperature ramps up from solidus to a peak at 20° to 40°C above liquidus and back down to solidus at between 1° and 3°C per second.

Cooldown: Product is cooled down to safe temperatures prior to handling.

Total Time: 100 to 360 seconds for most products and alloys, averaging 230 seconds.