

ALPHA[®] 4040

Wave Soldering Oil

DESCRIPTION

Many automatic wave soldering operations utilize oil to minimize solder dross formation and/or improve solder wetting. Hollis machines can be used with oil-intermix directly into the solder wave. Electrovert machines can be used with an optional “Positrol” forced oil-injection. Water-soluble oils, such as **ALPHA 4040**, are also used as heat-transfer fluids to reflow and fuse tin/lead plating on bare printed circuit boards.

ALPHA 4040 is a synthetic organic fluid containing special inhibitors for thermal stability. **ALPHA 4040** is completely water-soluble for use in aqueous processes. It is also solvent-soluble. The oil is non-corrosive to metals and self-lubricating to pump impellers. **ALPHA 4040** offers the advantages of low smoking, mild odor, high flash point and stability for extreme use at normal soldering temperatures.

READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

APPLICATION GUIDELINES

The method of introducing the ALPHA 4040 oil into the soldering equipment should conform to the recommendations of the equipment supplier. During production, the oil should be periodically examined and when signs of deterioration appear, such as heavy discoloration or charring, the oil should be replaced.

Proper Operation and Maintenance of Oil-Intermix Waver Soldering Machines

- A. Start Up:** First, turn on the solder pot heaters and exhaust. Empty the oil drain container. When the solder has reached the proper temperature, jog the solder pump and then turn it on. Add new oil to the proper level (until oil begins to overflow the drain at the rear of the machine). Open the oil valve fully to flush out the sump (1 to 2 minutes). Readjust the oil valve to the proper operating point. The oil should completely blanket the solder in the side plates.
- B. Shutdown:** At shutdown time, the oil valve should be shut off and the solder pumping continued as “purge”. Five (5) minutes of no-oil solder pumping is recommended.

After the prolonged purge, the solder pump is turned off and the old oil is drained. This is followed by quickly turning the solder pump on and off several times for final purging of oil traces. The pot heaters are then turned off. Any residual oil is wiped from outside surfaces.

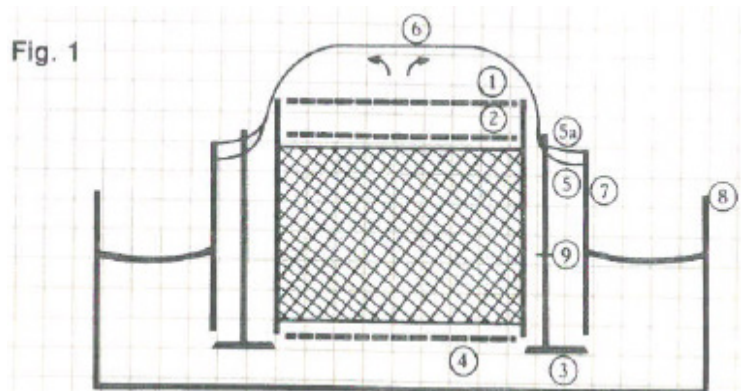
This shutdown procedure will keep deposits from building up in oil valves on oil-intermix machines. It will also minimize the amount of oil or flux remaining on various surfaces. After the solder pump is shut off, these hot surfaces tend to bake any residue. Such carbonized residues should be removed and not allowed to accumulate.

- C. Maintaining a Smooth Solder Wave:** The primary method of keeping the solder wave smooth is by proper care and maintenance of screens and baffles on a pumped solder wave sump (see Fig. 1).

To varying degrees, all soldering oils adhere to rough surfaces. The solder pot walls, sump walls, heating elements, sump baffles and screens, for example, are surfaces to which oil will adhere to. The Operating Manuals of Hollis and other machines discuss such regular, preventive maintenance. Periodic removal and cleaning of sump baffles and screens will prevent the build-up of charred oil that can cause solder wave roughness.

Legend:

1. Top Horizontal Baffle
2. Mid Horizontal Baffle
3. Choke Bar for regulation of solder level in side plates
4. Lower Horizontal Baffle
5. Solder Level in Sump at proper height; Do Not Overflow
6. Solder Wave
7. Side plate
8. Solder Pot
9. Choke Bar Adjusting Bolts (vertical baffles shown as cross-hatched area)



- D. Prevention of “Sludge” and “Solder Balling” Formation:** The proper solder and oil levels must be charged and maintained according to the equipment manufacturer’s recommendations. If too little solder or oil is in the pot, air will be sucked into the oil intake valve and a sludge will be generated.

In a Hollis machine, proper setting of the adjustable liquid level in the side plates will eliminate the formation of “solder balling” dross. These tiny balls of solder will accumulate and float on the surface of the molten solder because they are coated with oxide that prevents their dissolution.

The choke bar adjusting bolts should be set so that the solder level is just up to the top of the sump side plates but not overflowing. This minimizes the turbulence in the side plates. If solder is allowed to trickle over the side plates, it can generate sludge which can clog the oil valve.

- E. Baffle Plate Detinning:** Should any of the sump screens and baffles become detinned, the exposed rough base metal can cause solder wave roughness. Re-tinning can easily be accomplished by removing the screens or baffles, cleaning the surface with a stainless-steel brush or emery paper, dipping them in a strong solder flux (such as ALPHA 90) and dipping them in the molten solder.

TECHNICAL DATA

Item	Typical Values	Item	Typical Values
Appearance	Slightly viscous, clear colorless liquid	Pour Point	4 °C (40 °F)
Specific Gravity @ 25 °C (77 °F)	1.060 ± 0.010	Flash Point (COC)	293 °C (560 °F)
Pounds per Gallon @ 25 °C (77 °F)	8.80	Fire Point (COC)	316 °C (600 °F)
Viscosity @ 25 °C (77 °F) – Brookfield No.3, 50rpm	260 cps	Auto-Ignition Point*	427 °C (800 °F)
Shelf Life (from Date of Mfg.)	1080 days	* Solder bath temperature should not be allowed to exceed the Auto-Ignition temperature of the oil.	

RECYCLING SERVICES

We provide safe and efficient recycling services to help companies meet their environmental and legislative requirements and at the same time, maximize the value of their waste streams.

Our service collects solder dross, solder scrap, and various forms of solder paste waste. Please contact your local sales representative for recycling capabilities in your area or [link here](#).



SAFETY & WARNING

It is recommended that the company/operator read and review the Safety Data Sheets for the appropriate health and safety warnings before use. **Safety Data Sheets are available at MacdermidAlpha.com/assembly-solutions/knowledge-base.**

STORAGE

Once the container has been opened and the oil exposed, storage should be at room temperature in a low humidity environment to prevent condensation from forming inside the container.

CONTACT INFORMATION

**To confirm this document is the most recent version, please contact
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Also read carefully warning and safety information on the Safety Data Sheet. This data sheet contains technical information required for safe and economical operation of this product. READ IT THOROUGHLY PRIOR TO PRODUCT USE. Emergency safety directory assistance: US 1 202 464 2554, Europe + 44 1235 239 670, Asia + 65 3158 1074, Brazil 0800 707 7022 and 0800 172 020, Mexico 01800 002 1400 and (55) 5559 1588

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