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Foam Fluxing

Introduction

Foam fluxing is being used in wave soldering to apply flux to the PCB. The technology has mainly been replaced by spray fluxing but does offer some advantages.

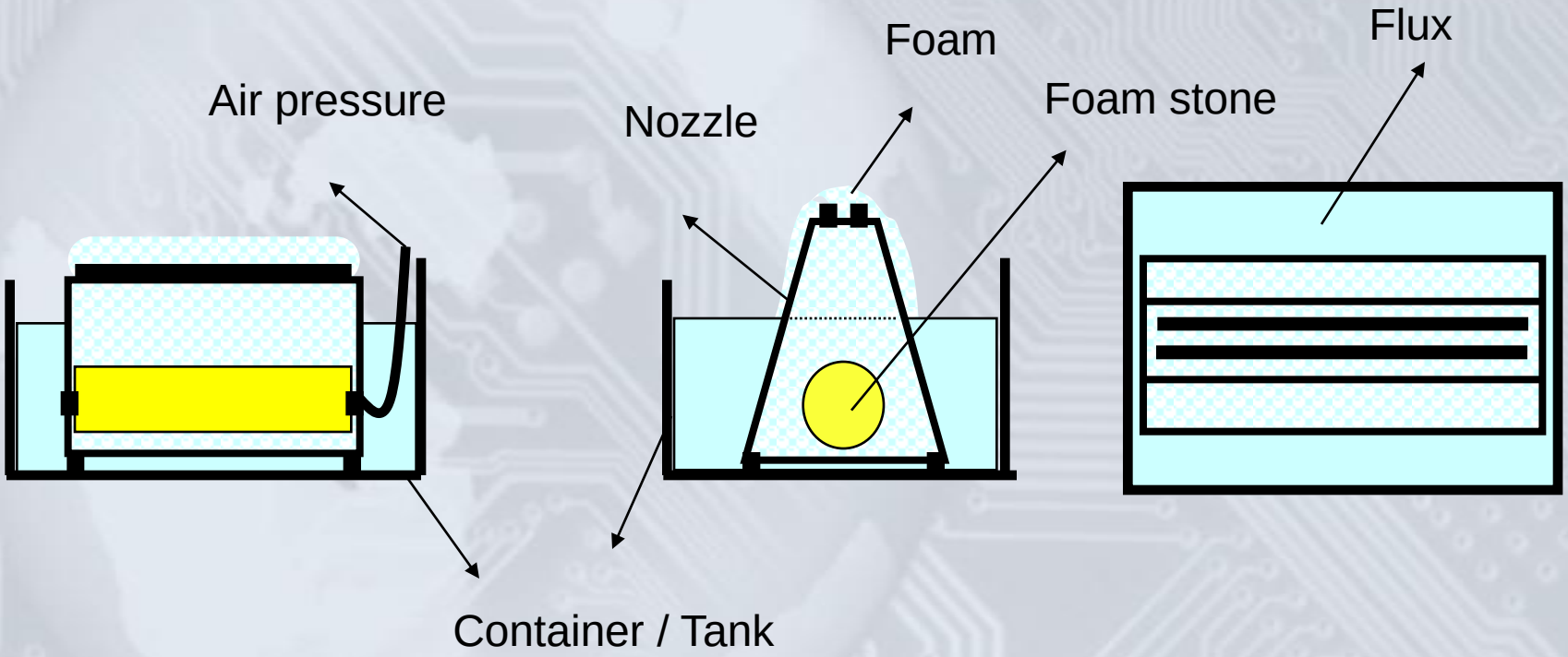
Advantages

- Good and equal flux wetting of the PCB and through holes
- Simple and cheap unit, no moving parts

Disadvantages

- No possibility to control flux amount, always maximal volume
- Open system with evaporation of the solvent : need for controlling the flux density or solid content with thinner
- Water from the air or pollution from the boards can be absorbed in the flux

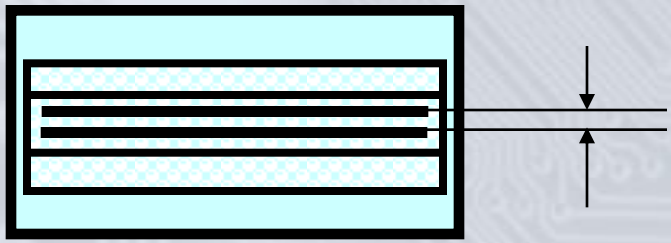
Foam fluxer principle



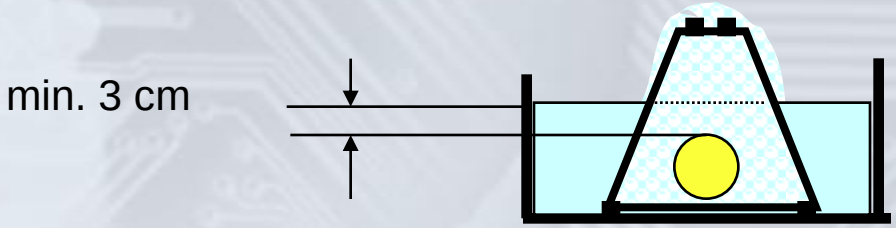
Materials: For the flux tank and nozzle, preferably stainless steel or HDPE.

Technical considerations

Opening of the nozzle: 8-10 mm is ideal



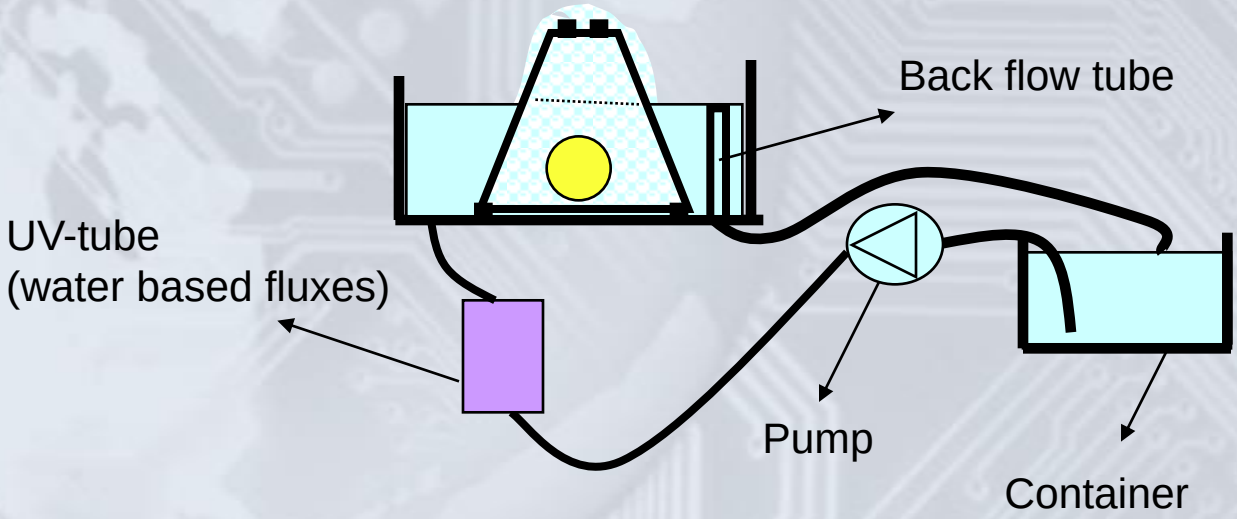
Flux level: At least 3 cm over the foam stone



Air pressure: As the air passes through the flux, an oil and water separator are necessary. Otherwise the flux can be polluted. Raise pressure until a nice and uniform foam is formed

Technical considerations

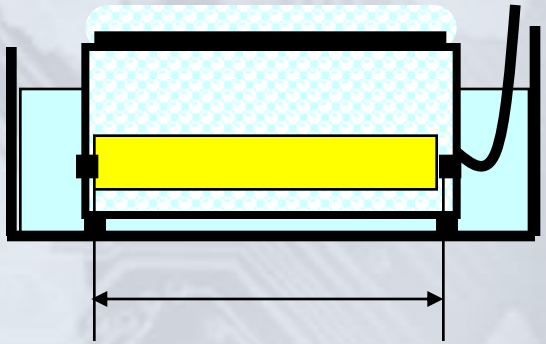
Stabilising unit: An over flow will create a stable flux level and promote a stable foam formation. For water based fluxes a UV-Tube can prevent biological pollution in the flux.



Technical considerations

The foam stone :

- For an equally distributed foam across the nozzle, the foam stone should have about the same length than the nozzle .



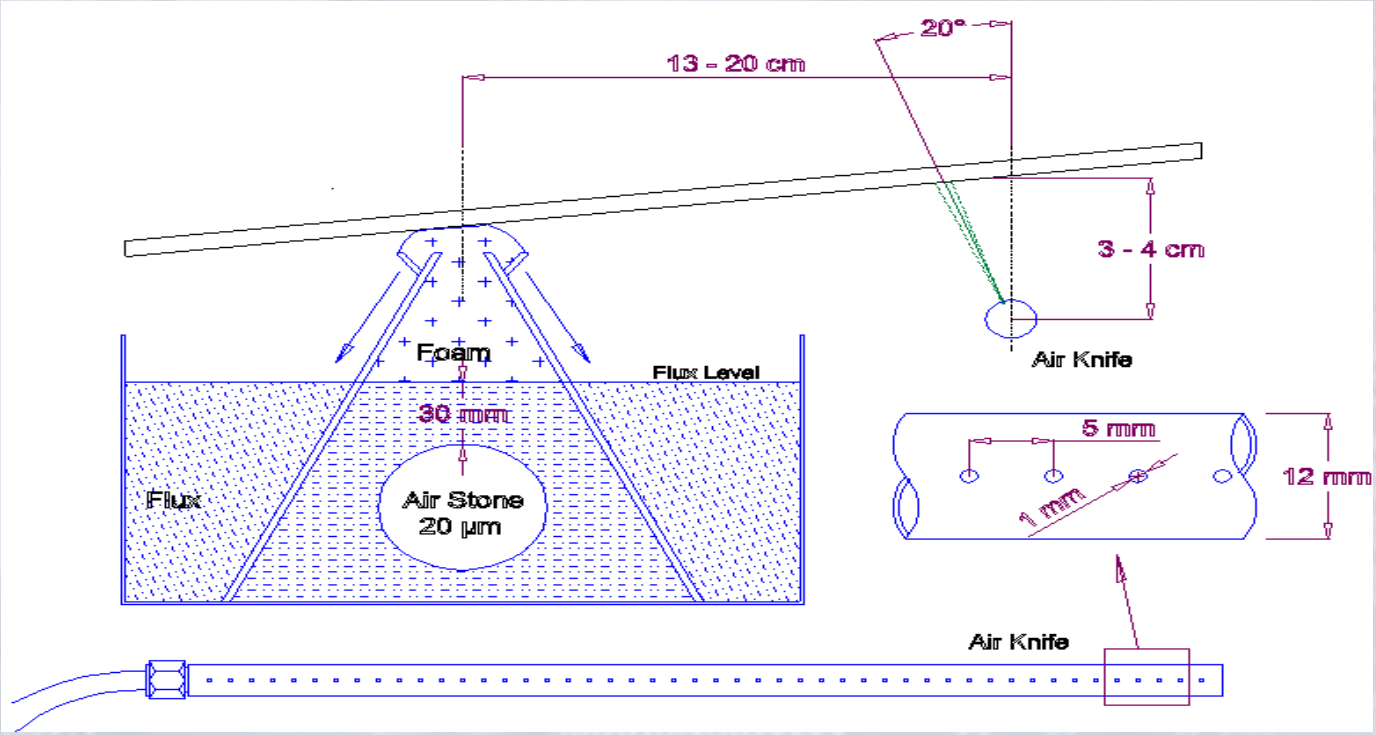
- If the foam stone has a finer grain size, the foam will be finer too (usually 10µm-20µm).

- A broken foam stone will give irregular foam, check the stone for damage.

Technical considerations

Air knife: is being used to blow off excessive flux back into the flux tank.

NOTE: Blowing too hard can cause de-wetting of the flux and bad soldering results.



Technical considerations

Setting up:

- Thoroughly clean the whole system with a solvent based cleaner. Let the foam stone foam in solvent for a while.

- Check the foam stone for visual damages. If present, replace the foam stone.

- Makes sure the length of the foam stone corresponds with the nozzle.

- Fill the tank with flux at least 3cm above the top of the stone.

- Adjust the air presure until a nice foaming quality is obtained.

- Check the air knife for obstructions of the holes and clean if necessary.

- Check the foam contact with a glass plate.

- Adjust the air knife air pressure so that excessive flux is blown off the glass plate back into the tank. Observe that the air pressure does **not** create dry spots on the glass plate.

- When idle for a long time. Clean out the whole system with a solvent based cleaner. Let the foam stone foam in solvent for a while. Keep the solvent in the unit and cover the unit.

Fluxes

IF 2005-series

- IF2005M (1,8%) IF2005K (2,5%) IF2005C (3,4%)
- great foaming ability
- thinner : T2005M

TS-series

- TS15 (1,5%) TS18(1,8%) TS22(2,2%) TS30(3,0%) TS33(3,3%)
- good foaming ability
- thinner: T1000

Note : It is important to use the right thinner for diluting the flux!

Fluxes

PacIFic-series

- PacIFic 2010F (2,5%)

- Thinner not necessary

- Water based fluxes are more difficult for foaming. In some cases the foam can thicken and built up in the tank after a while. The best solution in this case is to exchange the flux.

- After long exposure to air, biological pollution (algae) is possible but not dangerous. It can be filtered out or prevented by passing the flux through a UV-tube.

Flux control

Foam fluxing is an open system. Solvent evaporation will cause the solid content and density of the flux to rise. In practice, two ways are used to control this.

Density check

- the density and temperature of the flux are measured
- with the aid of a table, the right amount of thinner can be calculated
- simple and cheap
- does not take into account water absorption : risk on diluting too much

Titration

- with the aid of specialized tools and liquids, the exact solid content of the flux is determined by titration
- with the aid of a table, the right amount of thinner can be calculated
- more expensive but more accurate