



## Process file

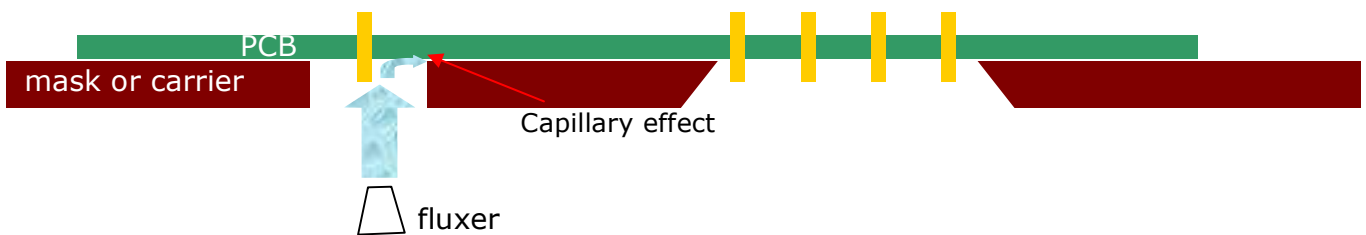
### Flux in solder wave shadow zones.

Because of the capillary action of liquid fluxes the flux is 'sucked' into small spaces and stays there hidden from the solder of solder waves which has a much different fluid behavior and surface tension and cannot go into the same spaces where the flux went. The result is pure flux residue in those spots untouched and not cleaned by solder wave activity.

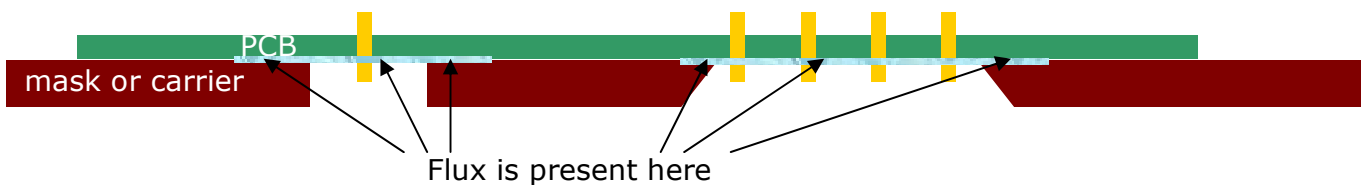
A classic case of this problem shows itself with the use of selective solder masks or carriers. The gasket between the PCB and the mask material is often loose or will get loose when passing through the process. Under the influence of temperature the PCB will warp causing open spaces between the PCB and mask material.



When fluxing the PCB the flux will be automatically sucked into the small openings between PCB and mask or carrier material due to the capillary effect.



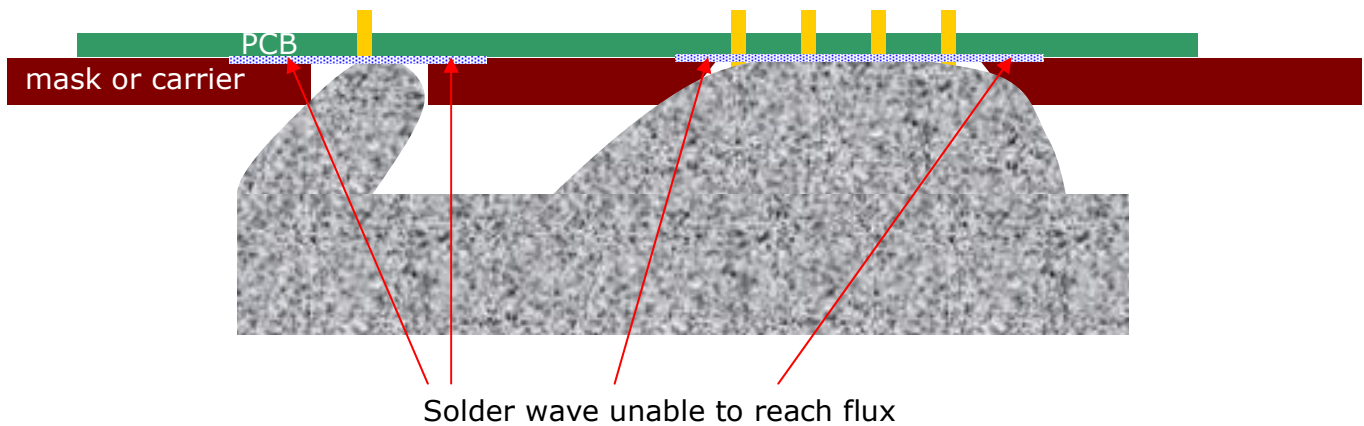
### Situation after fluxing



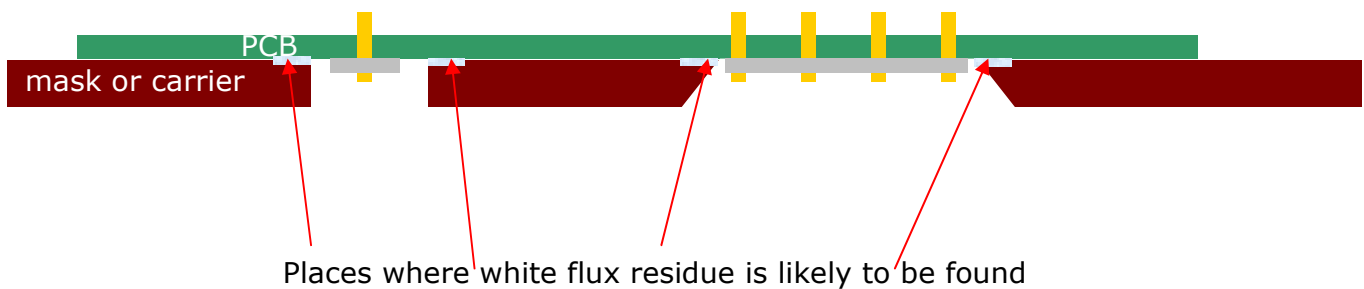


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Due to its different properties the solder from the solder waves cannot go into the small spaces where the flux is sucked into. Also the fact that most masks or carrier material are taken relatively thick, this will too have a 'push back' effect on the solder from the solder waves. Angled mask material will be better than straight edged mask material in minimizing this 'push back' effect.



### Situation **after soldering**



### Solutions:

- Try to avoid the use of material combinations which provide loose gaskets and therefore cause small openings which have a capillary effect
- A thin flexible, peel-off solder mask is preferred over thick rigid epoxy masks and carriers to shield off not to be soldered parts
- When using masks and carrier materials use them as thin as possible to minimize solder wave shadow effect.



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- Use angled mask and carrier openings instead of straight corners
- Use low porous mask and carrier materials
- Measure wave contact and contact times on PCB level not on mask or carrier level

### Basic rule:

**Avoid flux to get into spaces where the solder wave is unable to reach it**