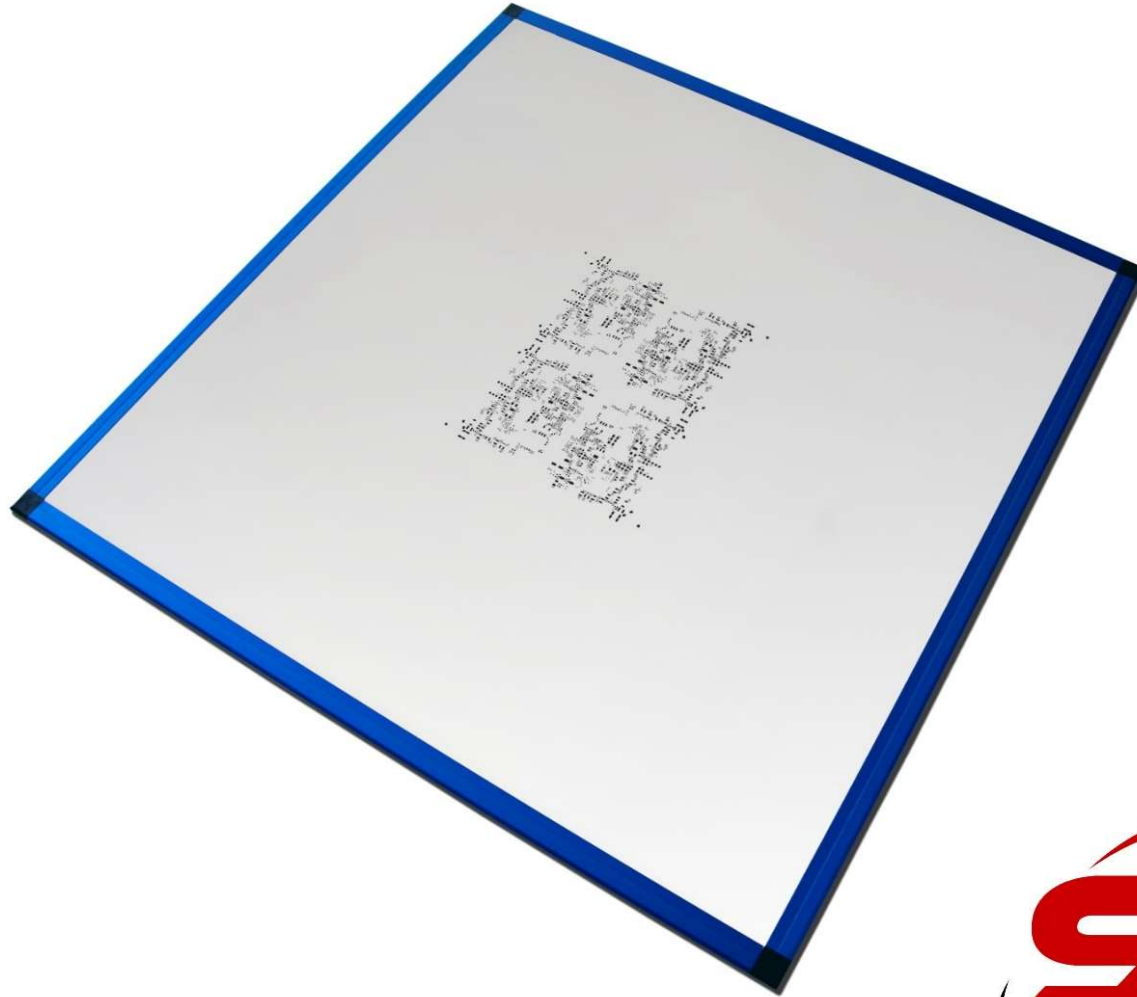


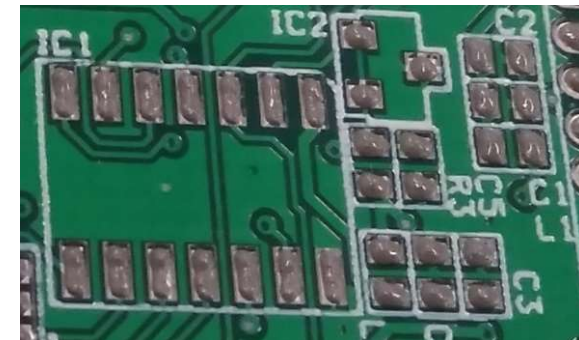
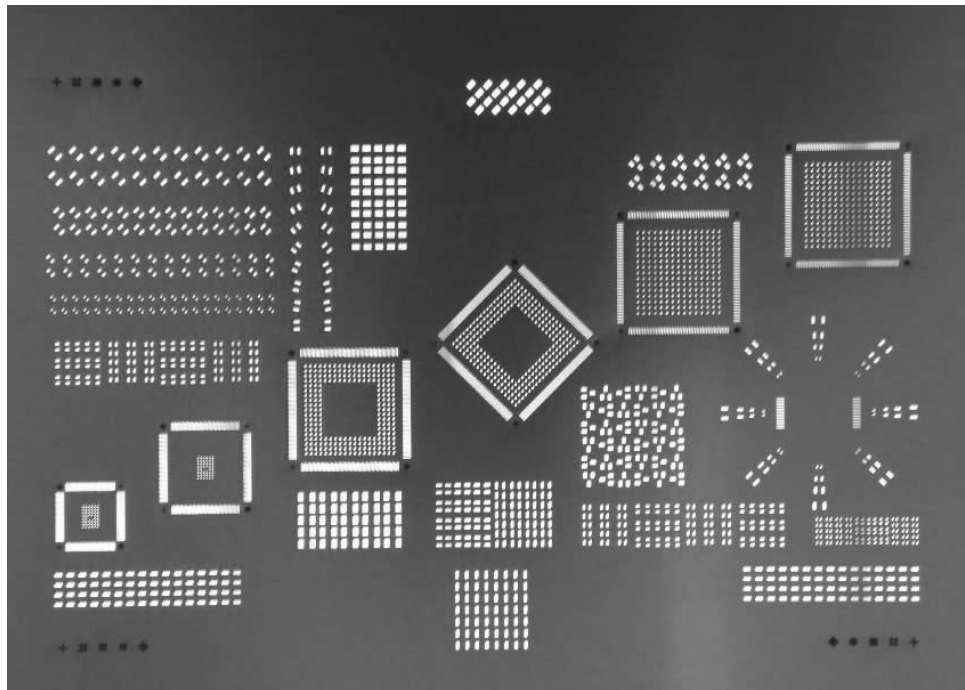
# SMD STENCILS



Electronic Service LTD

# WHAT IS A STENCIL

**Solder paste stencils** are used to apply **solder** depots on printed circuit boards with a screen printing technique. **SMD** components (**SMD** = surface mounted device) are placed within these depots subsequently and soldered with a following reflow- or vapor phase process.



# TYPE OF STENCILS

Standard stencil



VectorGuard stencil

# TYPE OF STENCILS

Stencils glued in aluminium frame

- 22x22“, 23x23“, 29x29“, 400x500mm, 550x650mm



Big aluminium frames

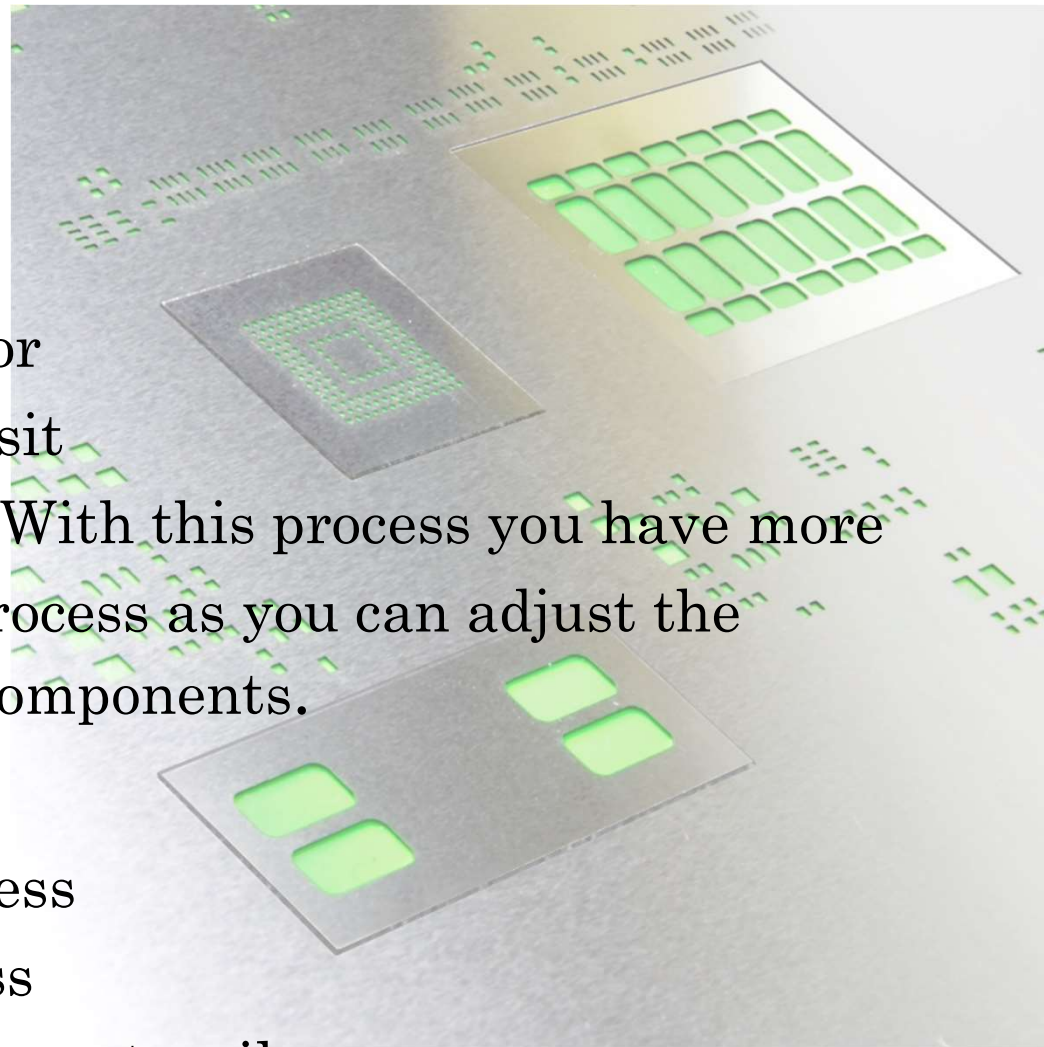
- up to 736x1800mm

# TYPE OF STENCILS

## Step stencils

Step stencils are developed for printing different paste deposit heights in one printing step. With this process you have more control over stencil printing process as you can adjust the height of the paste for each components.

- ❖ Step down to 80um thickness
- ❖ Step up to 300um thickness
- ❖ Step up and step down in one stencil

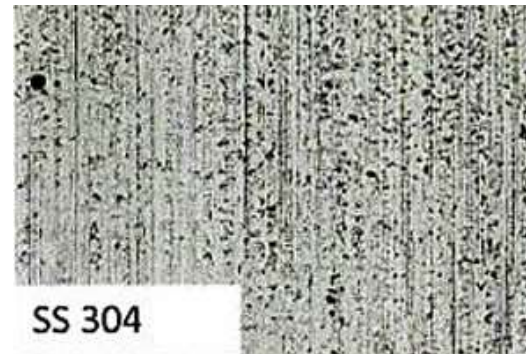




# MATERIAL

## Stainless steel grade 304 full hard

- 15-25um grain
- tensile: 1329 N/mm<sup>2</sup>
- Elongation 5.0%
- Hardness: 408 HV



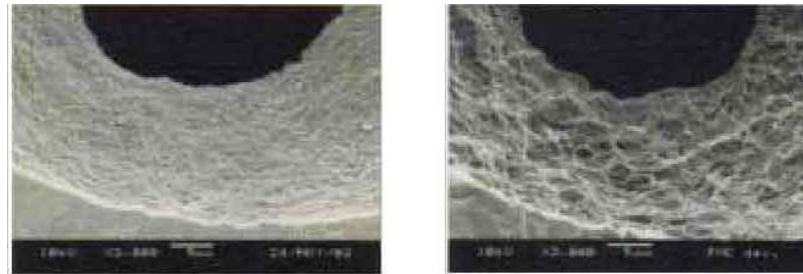
## Fine Grain (substitute for Nickel alloy)

- 1-2um grain
- Tensile:  $\geq 1000$ N/mm<sup>2</sup>
- Elongation: 5.0%
- Hardness:  $\geq 370$  HV

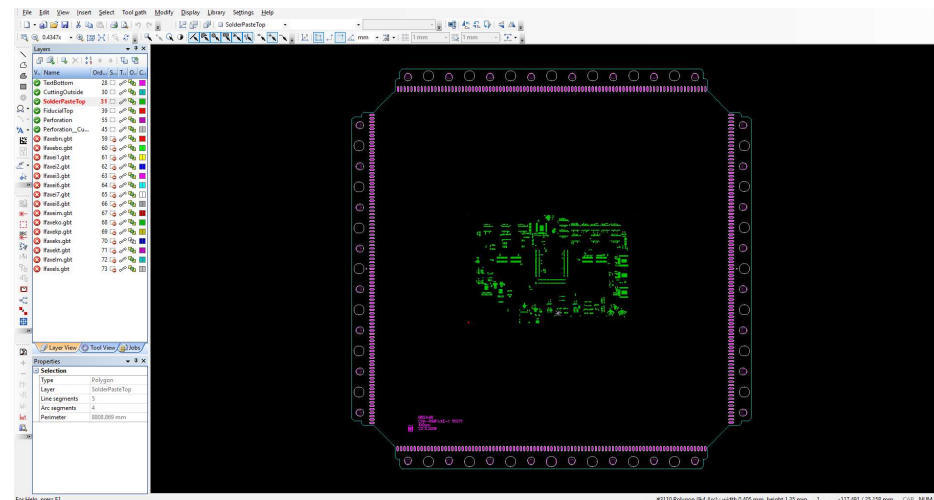


# BENEFITS OF FINE GRAIN MATERIAL

- ❖ Cleaner and smoother cut
- ❖ Better paste reflow, reduce manufacturing defects
- ❖ Improved gasketing and increase life of stencil
- ❖ High performance and lower cost compared to Nickel



# STENCIL PRODUCTION

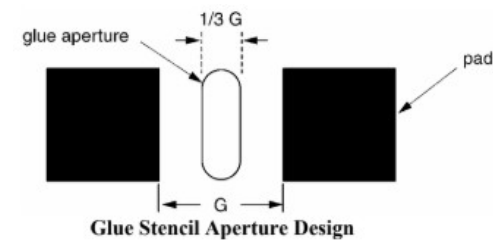
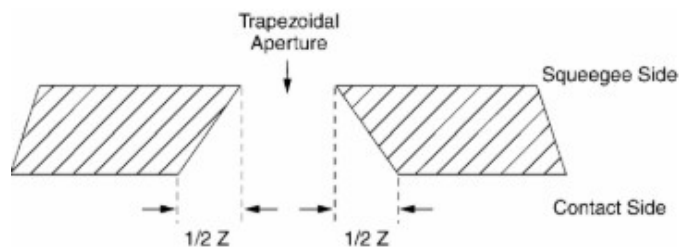
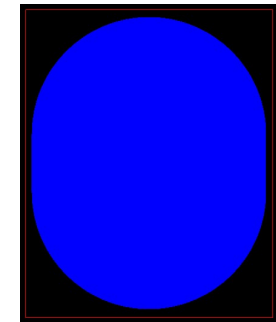
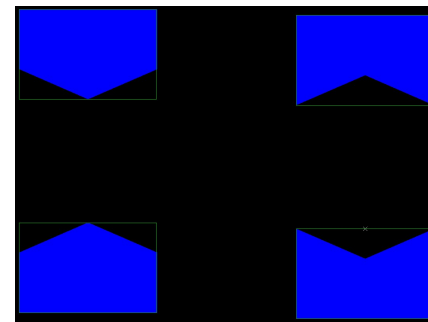
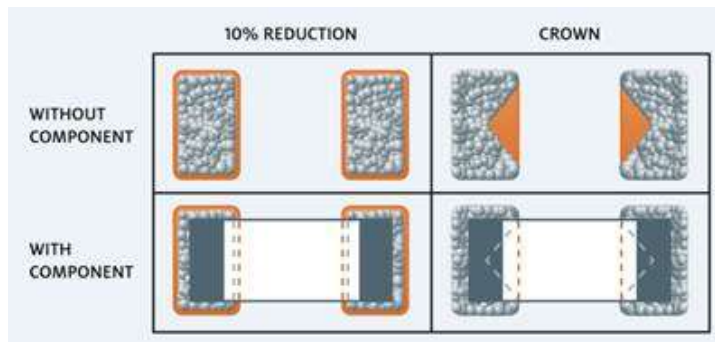




# STENCIL PRODUCTION

## Stencil design

- ❖ Modifications (homeplate, bowtie, oblong, rounding)
- ❖ IPC-7525L standard
- ❖ Area reduction or extensions



# THICKNESS

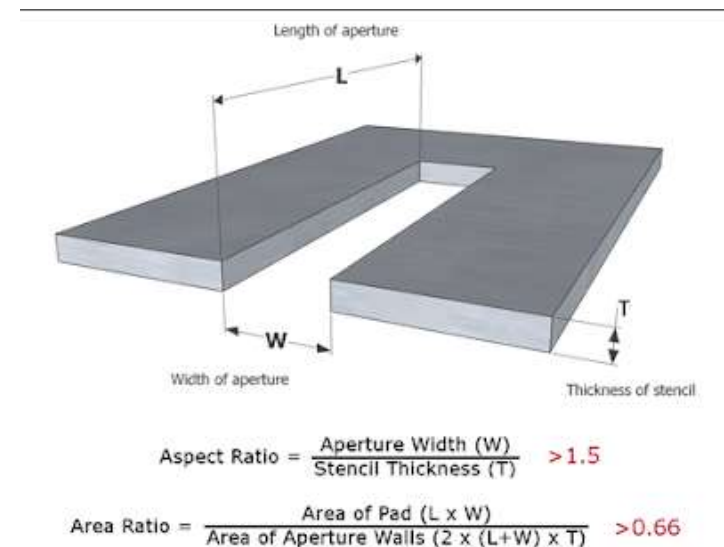
In order to achieve proper paste release from the stencil, the aspect ratio of an opening should be  $> 1.5$  and the area ratio  $> 0.66$ .

When the stencil detaches from the circuit board, the paste release encounters a competing process. Solder paste will either transfer to the pad of the board or stick to the opening sidewalls.

When the opening area is larger than 0.66 of the inner wall area, complete paste transfer occurs.

We check this ratio with our DRC (design rule check)

Available thicknesses are between  $80\mu$  and  $300\mu$



# PRODUCTION LINE

## LPKF Stencil Laser G6080

- ❖ Real-Time Process Control
- ❖ Cutting Gas Management Technology
- ❖ Automatic frame adjustment
- ❖ Stainless steel from 20um to 1mm



# END TREATMENT

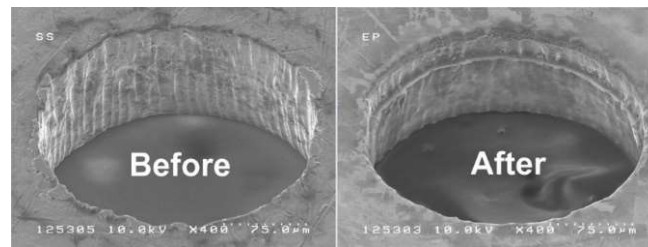
Dilg Ottomat double side brushing machine



# END TREATMENT

## Electropolishing

- ❖ Removal of burr inside stencil walls
- ❖ Improves paste release
- ❖ More resilient to corrosive cleaning agents
- ❖ Brightening
- ❖ Increase stencil life
- ❖ Reduce cleaning needs during use of stencil
- ❖ Reducing of sharp edges

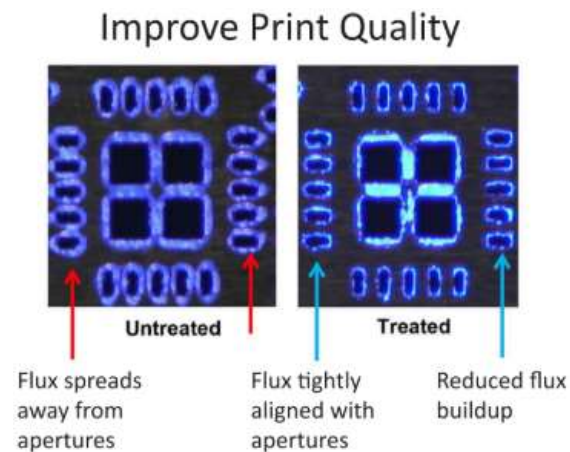




# END TREATMENT

## Nanocoating

- ❖ Improve print quality
- ❖ Survives aggressive wash cycle
- ❖ Improve print yield
- ❖ Reduce print variation
- ❖ Better print accuracy



# PACKAGING

Carton box with hanger



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