

# 8068 TA Printability test

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# | Content

1. Background
2. Test Plan
3. Equipment & Parameters
4. Results
  - Viscosity
  - TgA
  - RBO Au and Ceramic
  - Stencil Wiping Comparison
5. Conclusion & Path Forward

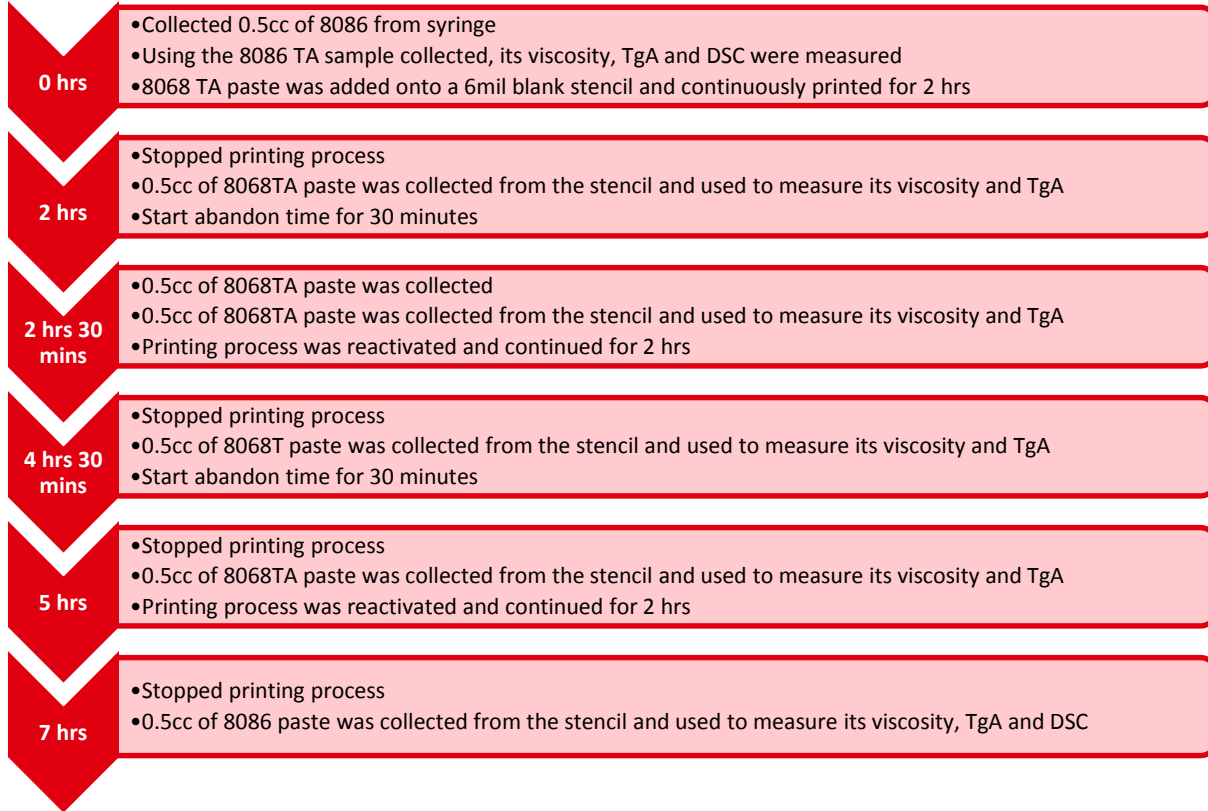
# Background

- 8068TA is a high thermal solution from Henkel, currently being promoted as Lead Free alternative for solder.
- A certain level of interest came from most of customer and would like to know if this material can be printed similar to solder.
- Printing process is preferred by customer for application using wide format LDF whereby dispensing is regarded as bottle neck. Besides UPH, customer also feedback that printing enables them to have a better control of the fillet height and BLT during DA.

*The objective of this test is to check whether 8068TA is suitable for printing base on*

- *Stencil work life*
- *Deposition/ print profile consistency*

# | Test Plan



# | Equipment & Parameters

## Printing Parameters

- Print Speed: 15mm/s
- Squeegee Pressure: 10 kg
- Separation Speed: 1mm/s



Squeegee



Blank Stencil



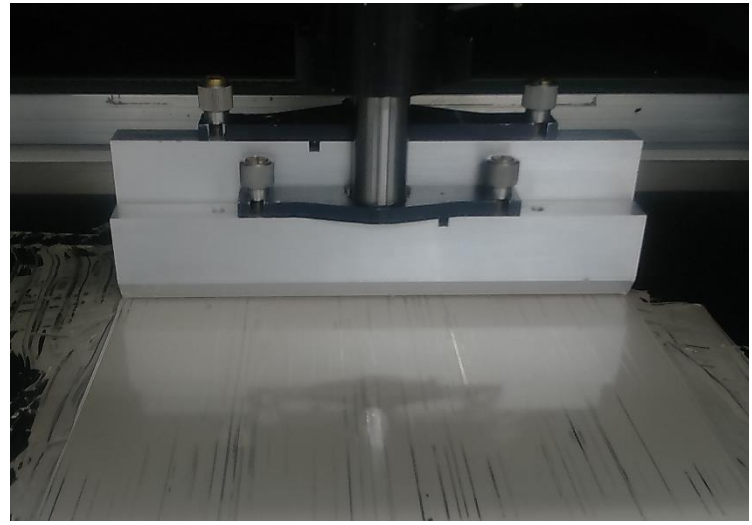
Printer

# | Result

## Stencil Life



0 hrs print



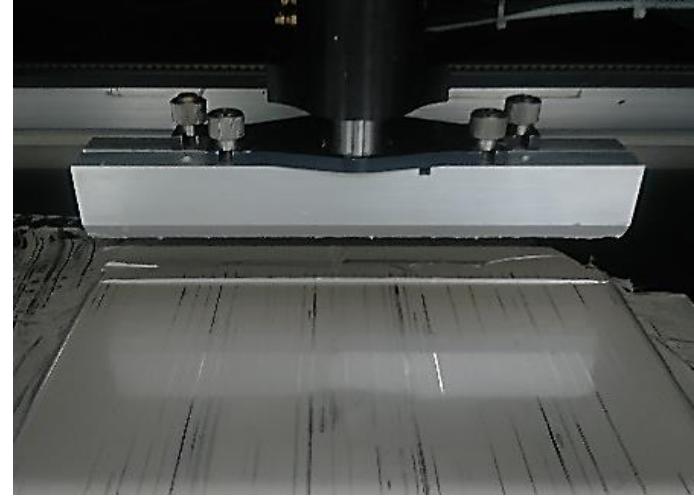
2 hrs print

# | Result

## Stencil Life



4 hrs print



8 hrs print

# Results

## Viscosity

8068TA Stencil Exposure time	Viscosity (cP)
0 hrs	9528
1 hr 30 mins	More paste added onto stencil
2 hrs	10190
Abandon 30 mins	10190
3 hr 40 mins	More paste added onto stencil
4 hrs	10610
Abandon 30 mins	10520
8 hrs	11180



TC500 Water Bath

- Viscosity of 8068 Ta paste did not vary much through time
- Noted 14% viscosity increase at 6 hours from time zero, however increase is still within 25% Henkel specification.



# | TGA Analysis

8068TA Stencil Exposure time	%Weight Loss @ 100C	%Weight Loss @ 200C	%Weight Loss @ 300C	%Weight Loss @ 400C	%Weight Loss @ 500C
0 hrs	0.225	2.611	4.053	8.101	9.739
1 hr 30 mins	More paste added onto stencil				
2 hrs	0.284	2.933	4.235	8.066	9.756
3 hr 40 mins	More paste added onto stencil				
4 hrs	0.184	2.402	3.744	7.882	9.342
6 hrs	0.242	2.741	3.898	7.831	9.313

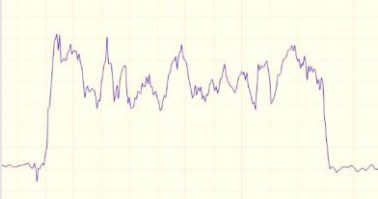



TgA

- Profile: 10 Deg/min – 500 DegC ; CP51, 5 rpm @ 25DegC
- No significant difference in terms of weight loss over 6 hour print time.

# | Print Test

## Screen vs Stencil

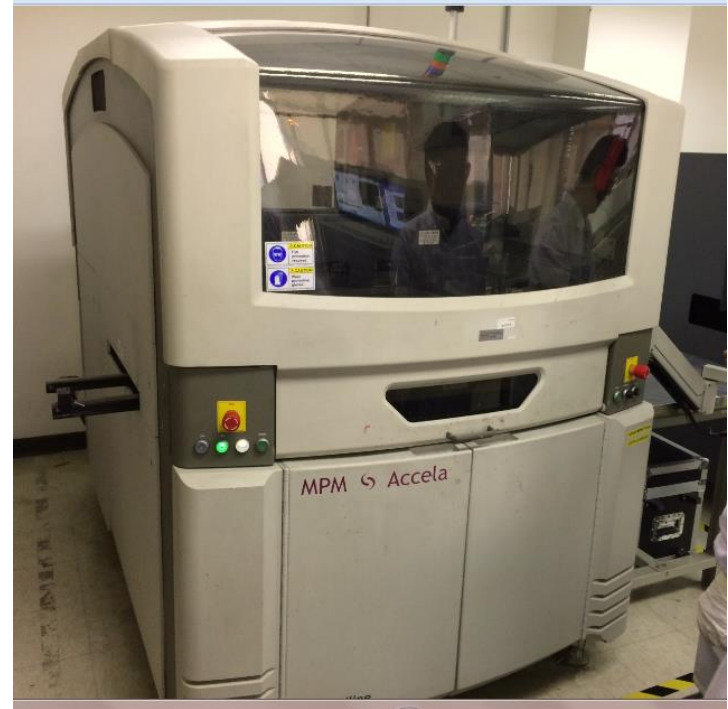
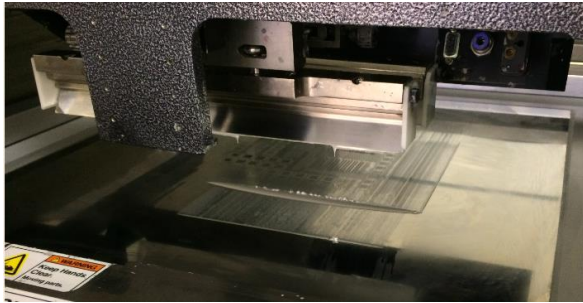
Method		Shape profile	Rz
Screen	400 Mesh D85 rubber squeegee Theoretical thickness 27 ums	Good and sharp	 <p>Peak to peak : 14 microns</p>
Metal	80 microns thick Laser cut, metal squeegee	Rounded	 <p>Peak to peak : 5 microns</p>

Proceed with stencil study, as it has better Rz

# 8068 TA Stencil Print Test

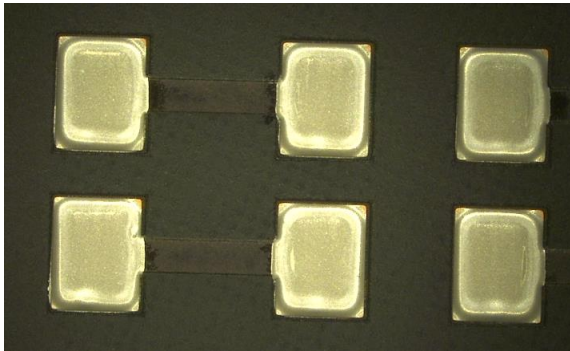
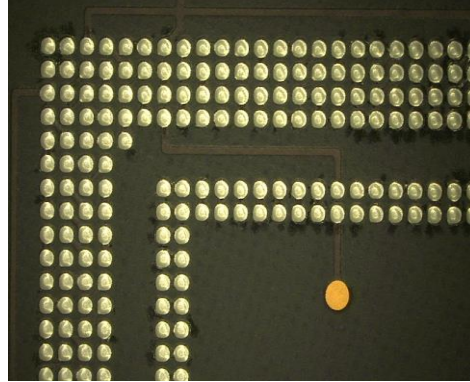
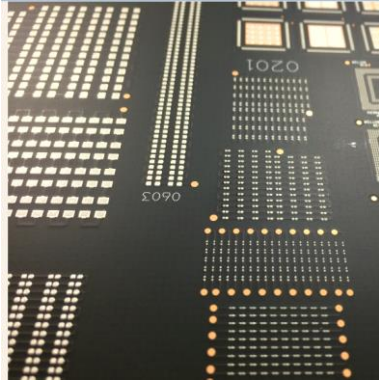
# Stencil Print Equipment & Parameters

- MPM Accela
- 12 "Metal blade squeegee
- Print Pressure : 12 Kgf
- Print speed; 30 mm/s
- Print gap 2mm/sec



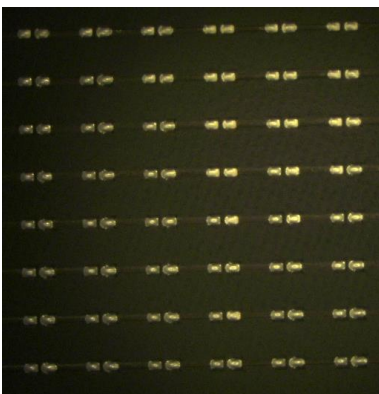
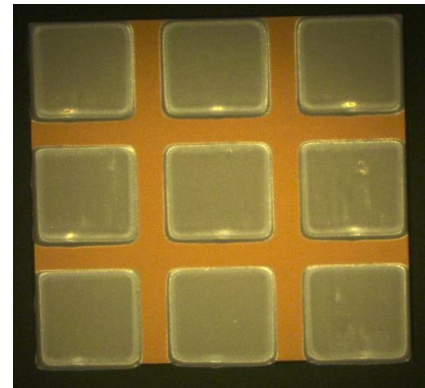
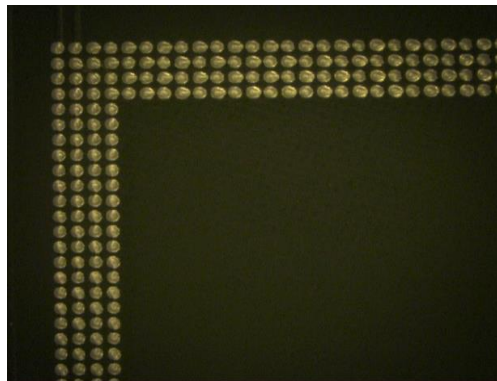
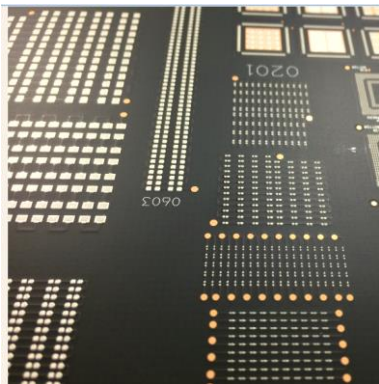
# Stencil Print Test

## 0 Hr results



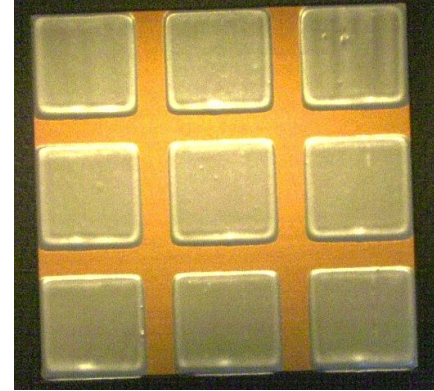
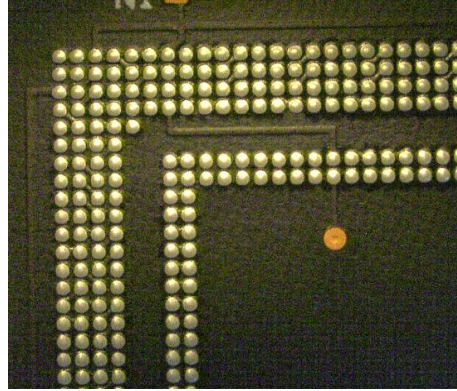
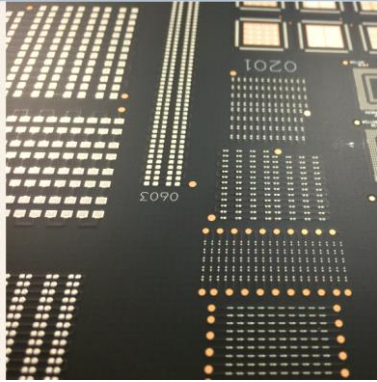
- ❑ Good profile
- ❑ No Smear
- ❑ No bridging on 400 um pitch (200 um gap)
- ❑ Printable 200 um aperture size

# Stencil Print Test 4Hr results



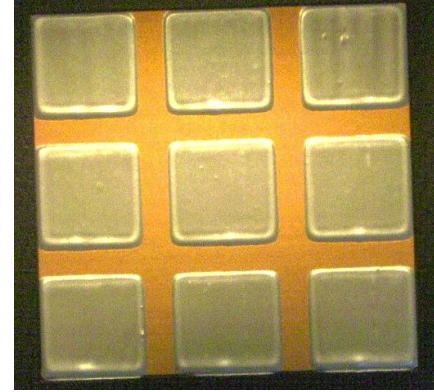
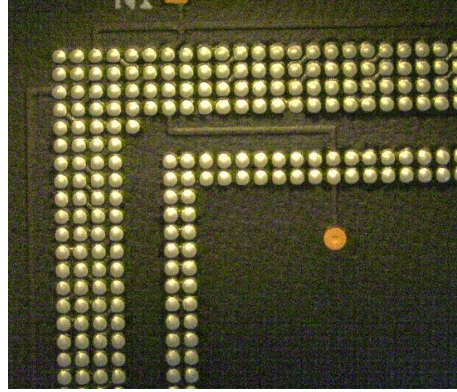
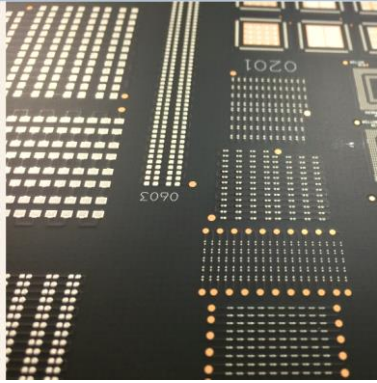
- ❑ Good profile
- ❑ No Smear
- ❑ No bridging on 200 um gap
- ❑ Good deposition 01005

# Stencil Print Test 8Hr results



- ❑ Good profile
- ❑ No Smear
- ❑ No bridging on 200 um gap
- ❑ Good deposition 01005

# Stencil Print Test 8Hr results

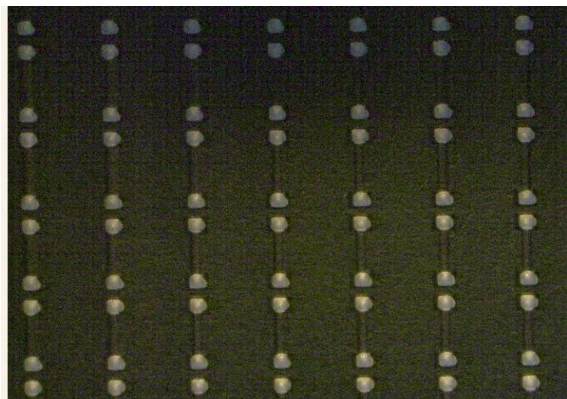
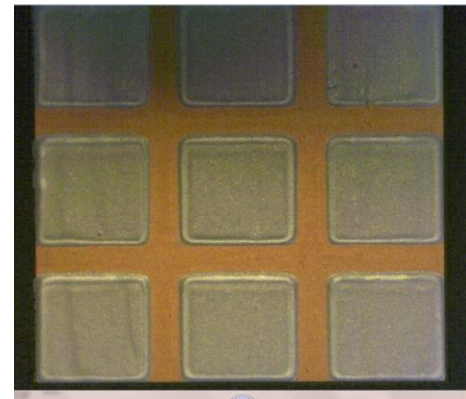
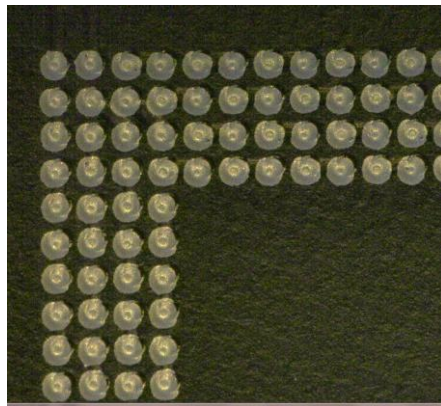
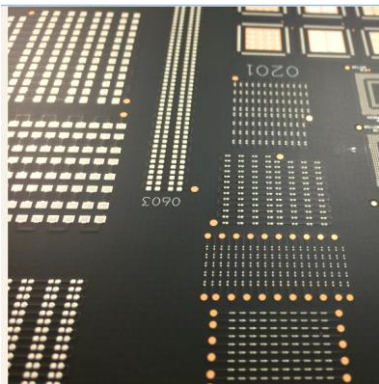


- ❑ Good profile
- ❑ No Smear
- ❑ No bridging on 200 um gap
- ❑ Good deposition 01005



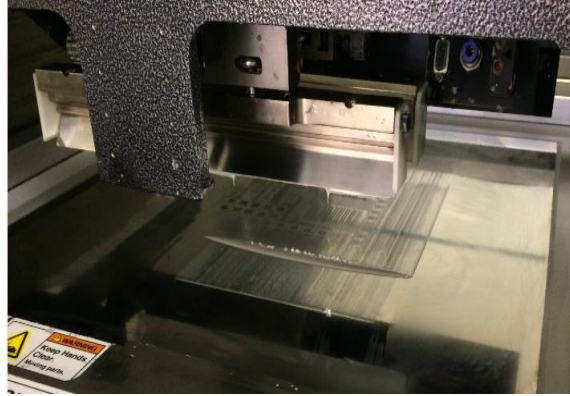
# Stencil Print Test

## 24Hr results



- ❑ Good profile
- ❑ No Smear
- ❑ No bridging on 200 ums gap
- ❑ Good deposition 01005

# Stencil Print Wipe 0Hr vs 24 Hr



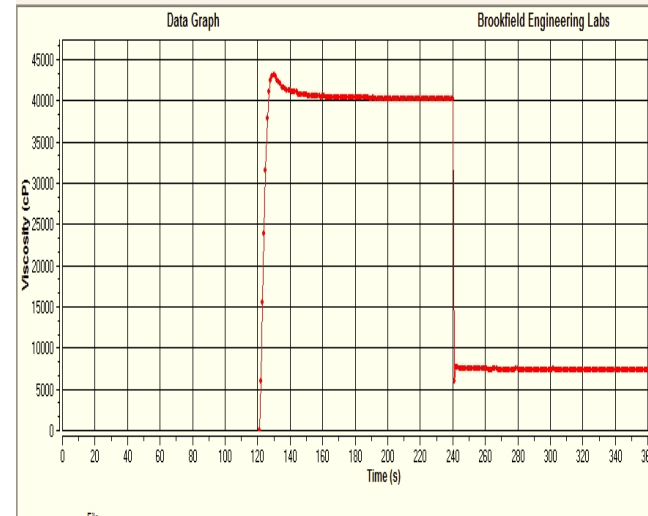
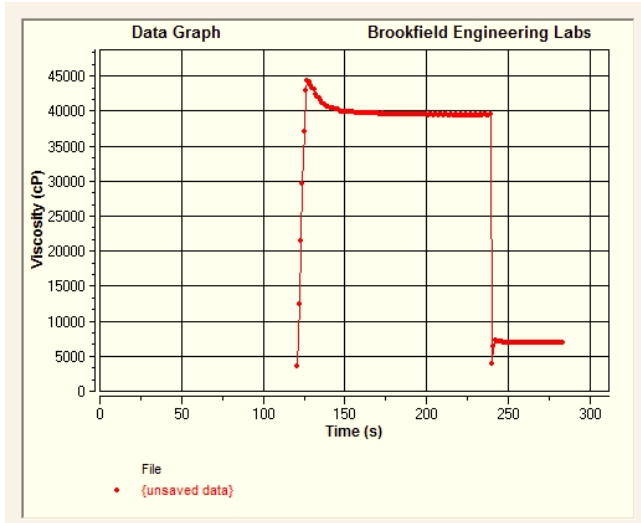
0 Hr



24 Hr

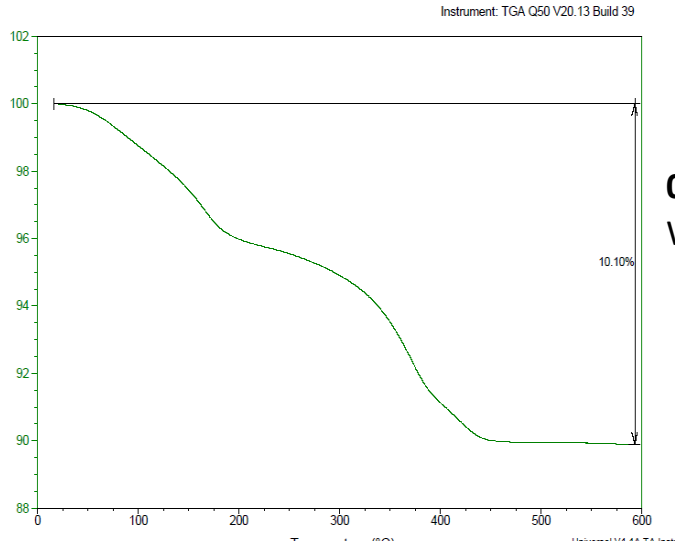
Good Wiping maintained after 24 hours

# Viscosity comparison 0Hr vs 24 Hr Stencil

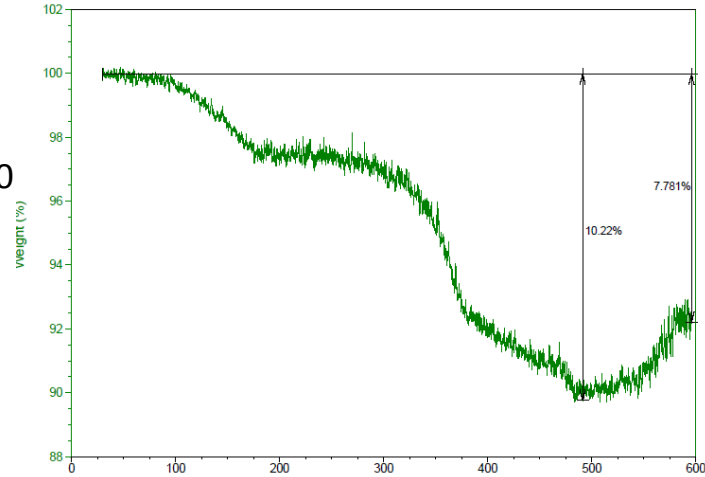


- Specimen @ 0 hr is taken from jar
- Specimen @24 hrs is taken from Stencil
- 7% increase in viscosity below 25% (defined for work life)

# TgA comparison 0Hr vs 24 Hr Stencil



**0 Hr**  
Wt loss : 10.10



**24Hr**  
Wt loss : 10.22

- Specimen @ zero hour is taken from jar
- Specimen @ 24 hours is taken from stencil
- Comparable weight loss 0 hr and 24 hr is comparable

# | Proposal

- There is a pulling effect noted on 80 microns stencil, additional assessment for 50 microns. In theory, thinner aperture wall thickness reduces pulling effect.
- In parallel, will need to asses higher viscosity.

**Thank you!**