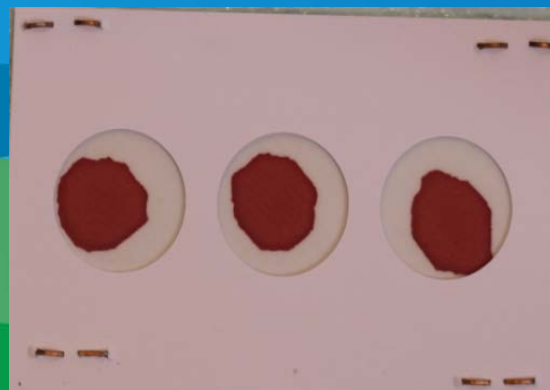
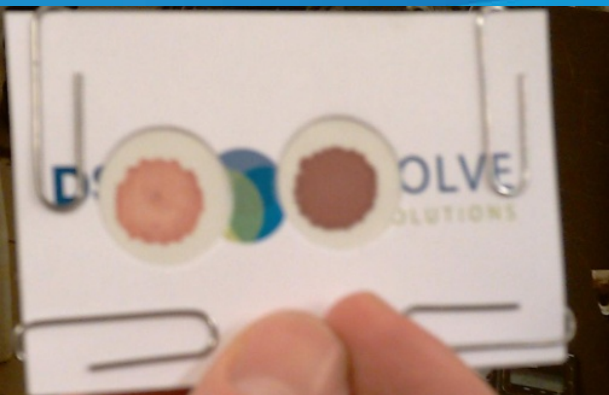


# New Ht independent dried blood spot cards discussion

Ynze Mengerink

Barcelona, November 21<sup>st</sup> 2013

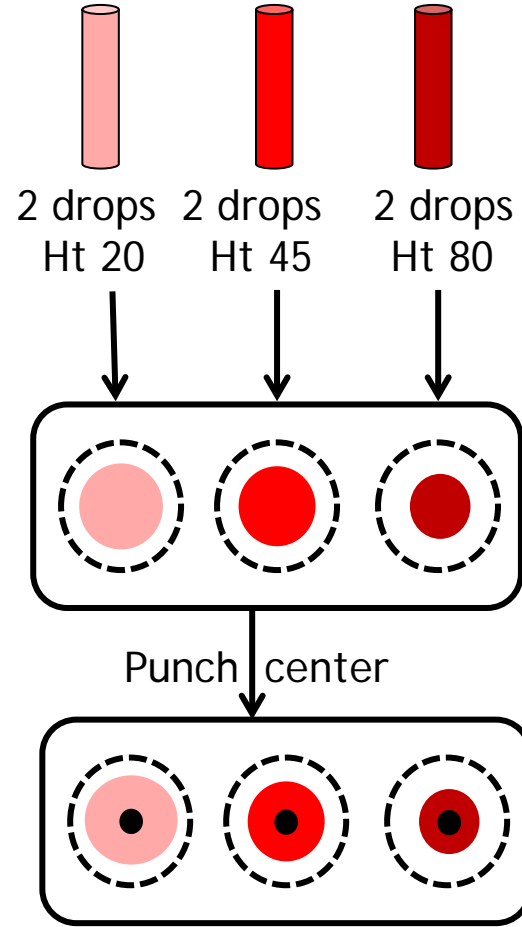
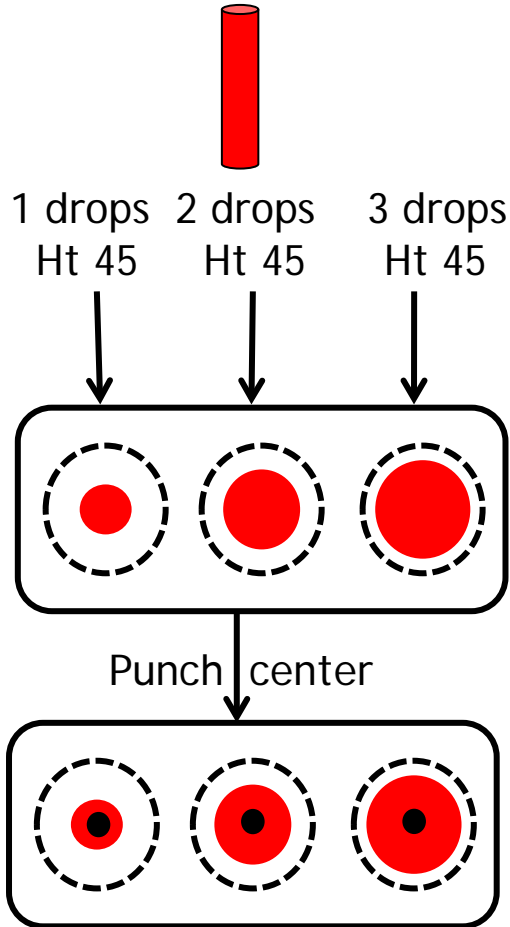
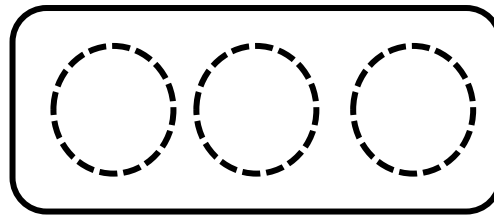


# What is the Hematocrit effect

?



# DBS Card

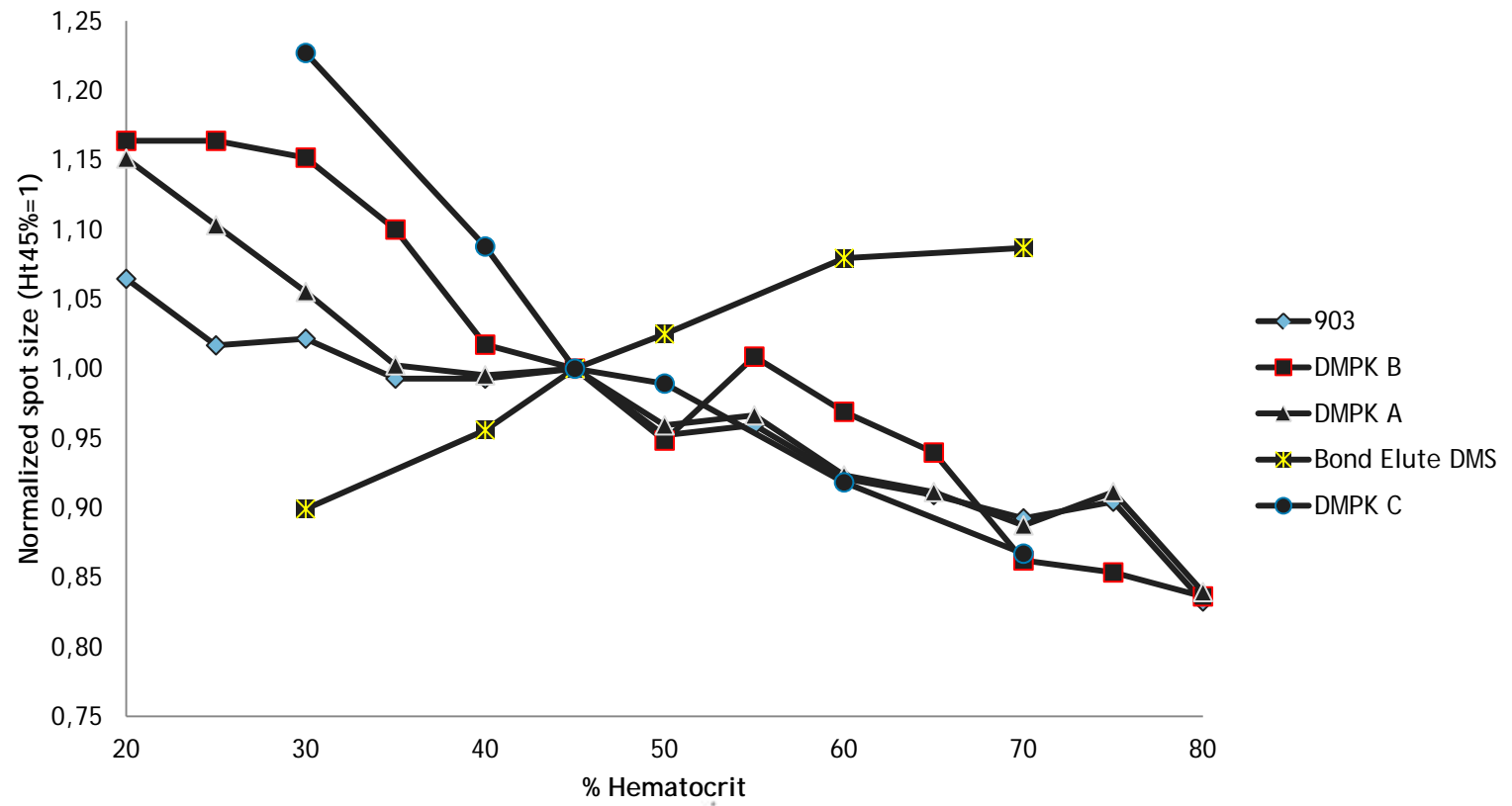


Each Punch contains same volume of blood

Each Punch contains not the same volume of blood

# Ht effect on commercial available DBS Cards

## Influence of Hematocrit on Spot Size



# What causes the Hematocrit effect

?















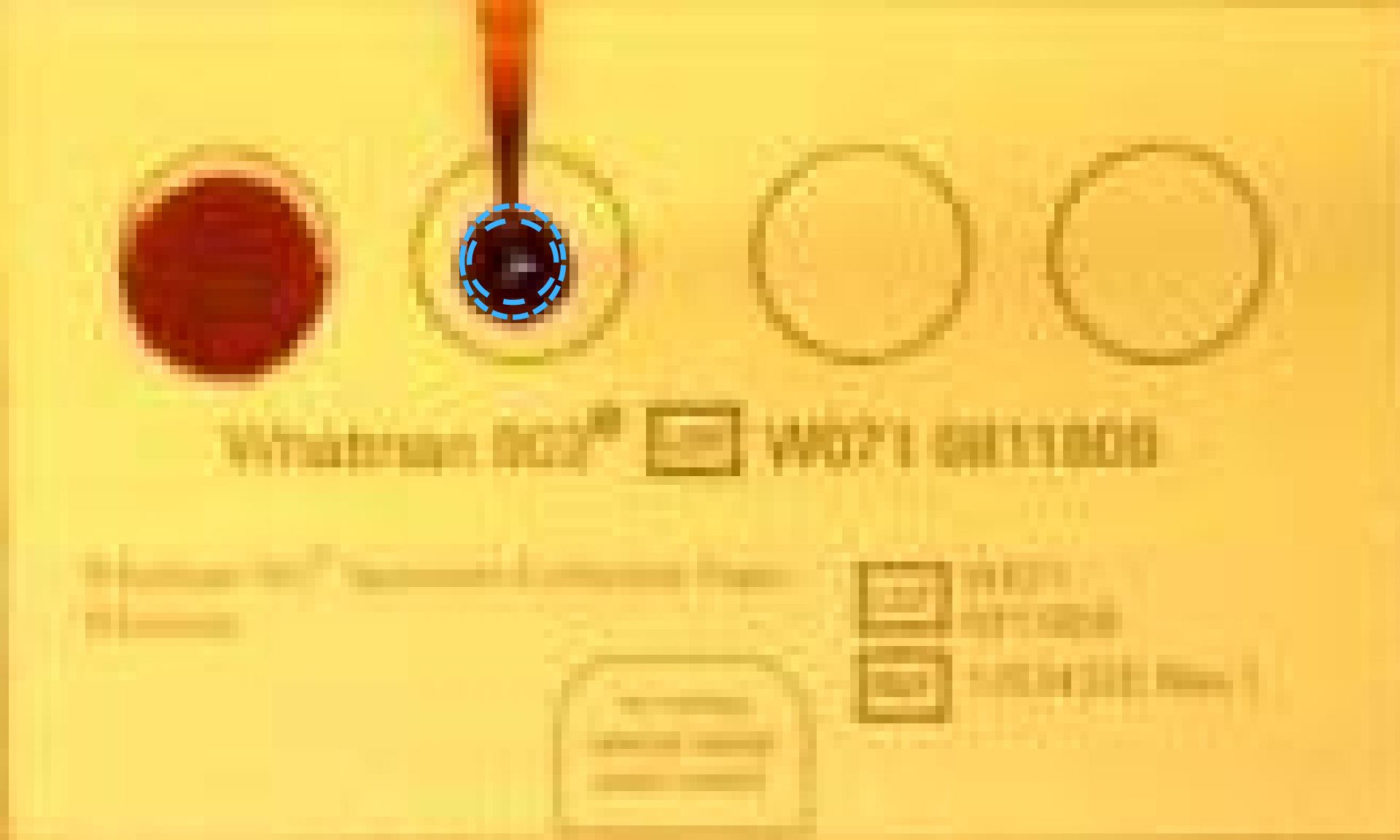


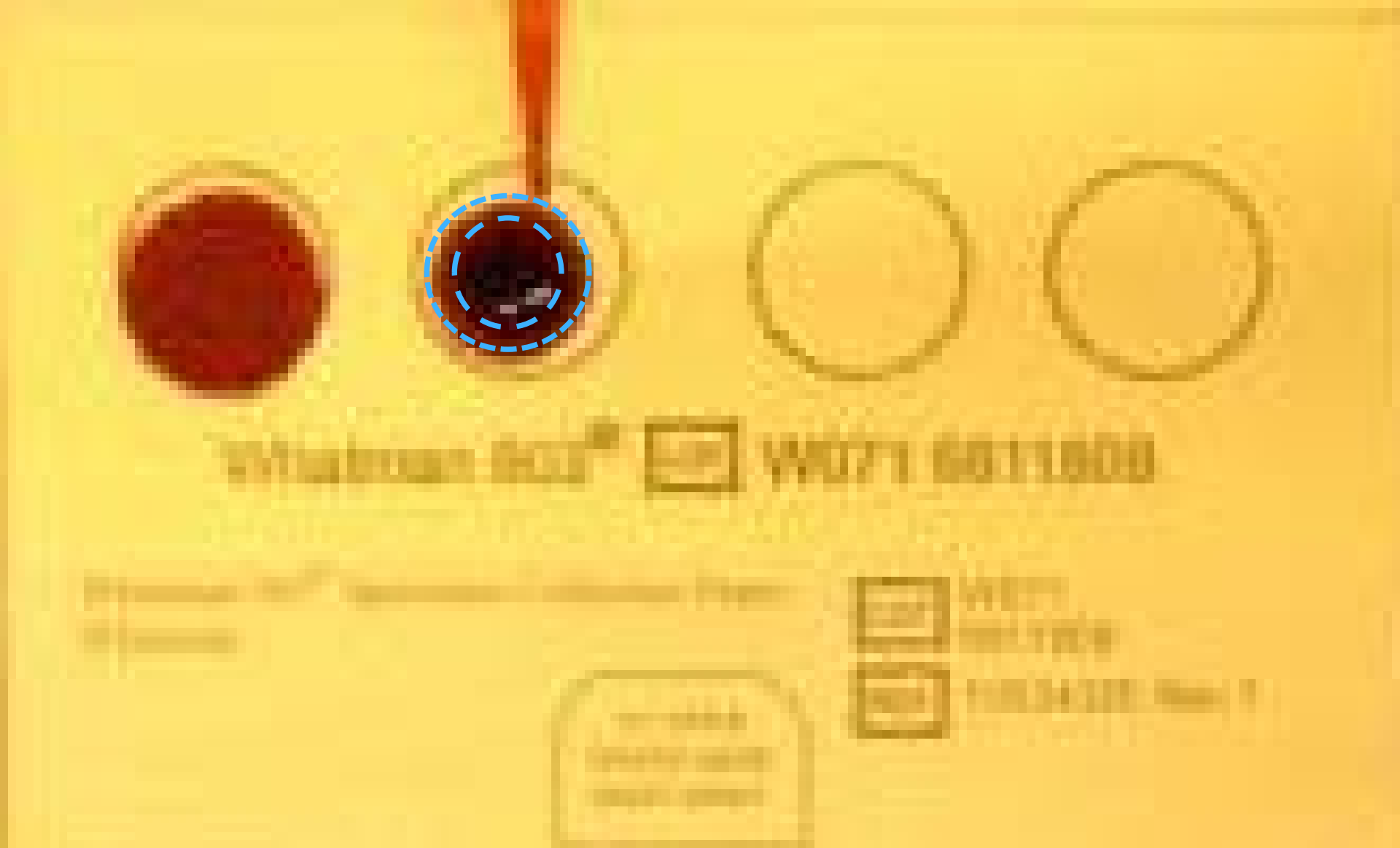


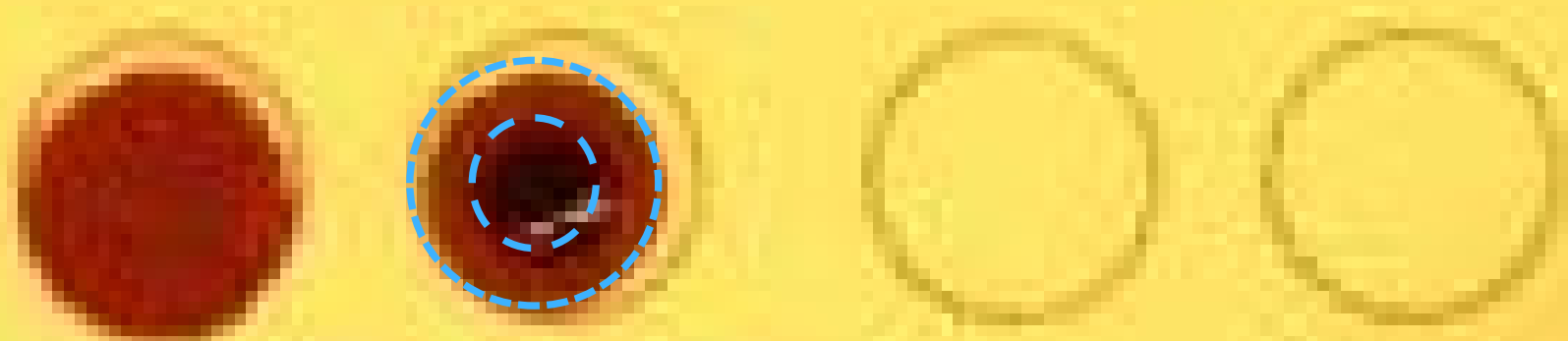


Vitabond 900<sup>®</sup>  VAD71 6011800

Product Name	Product Code	Product Description
Vitabond 900 <sup>®</sup>	VAD71 6011800	...
Vitabond 900 <sup>®</sup>	VAD71 6011800	...





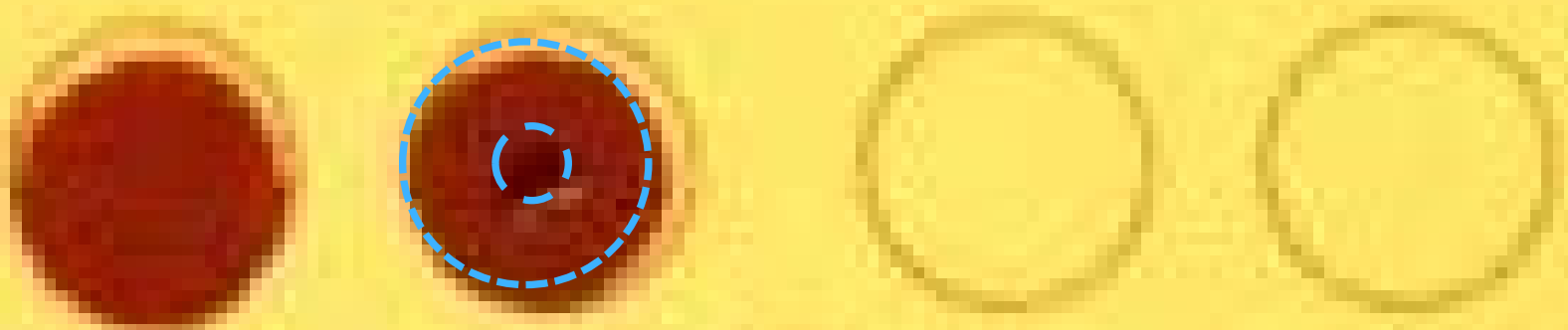


INITIAL STATE  MOST COMMON







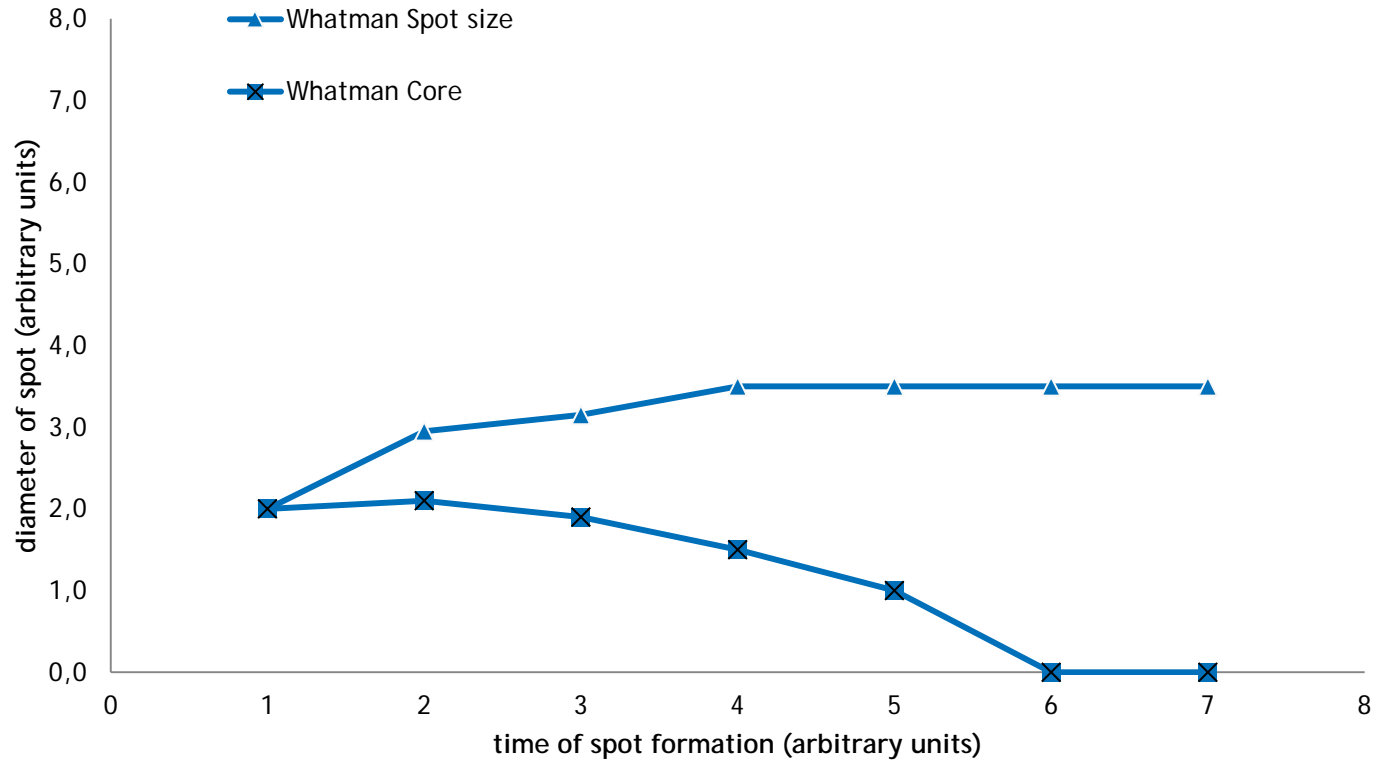


INITIALS [ ] WORK IN PROGRESS



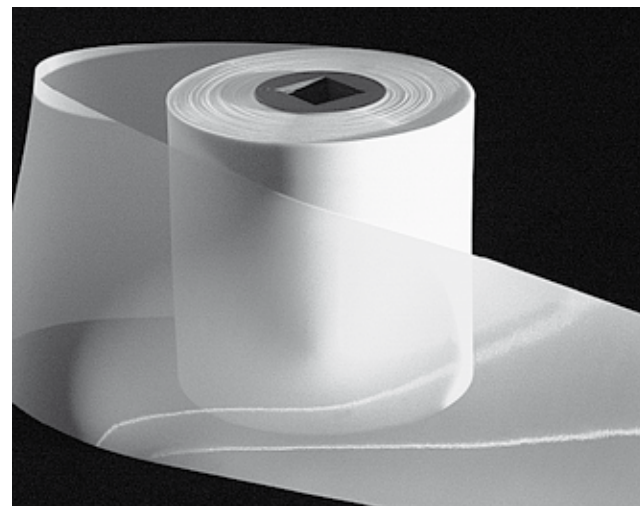
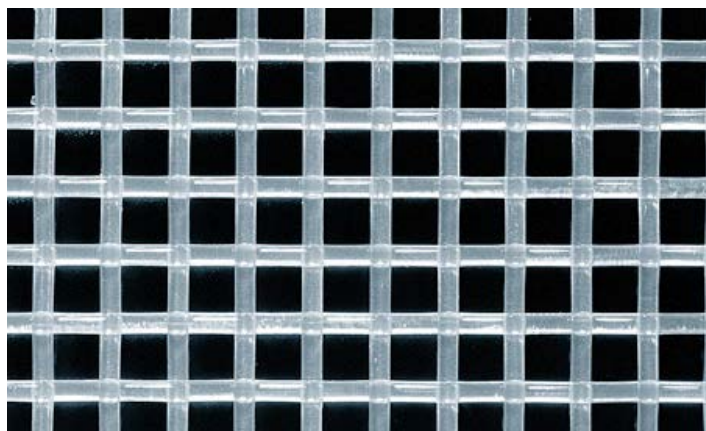


# Bloodspot spreading



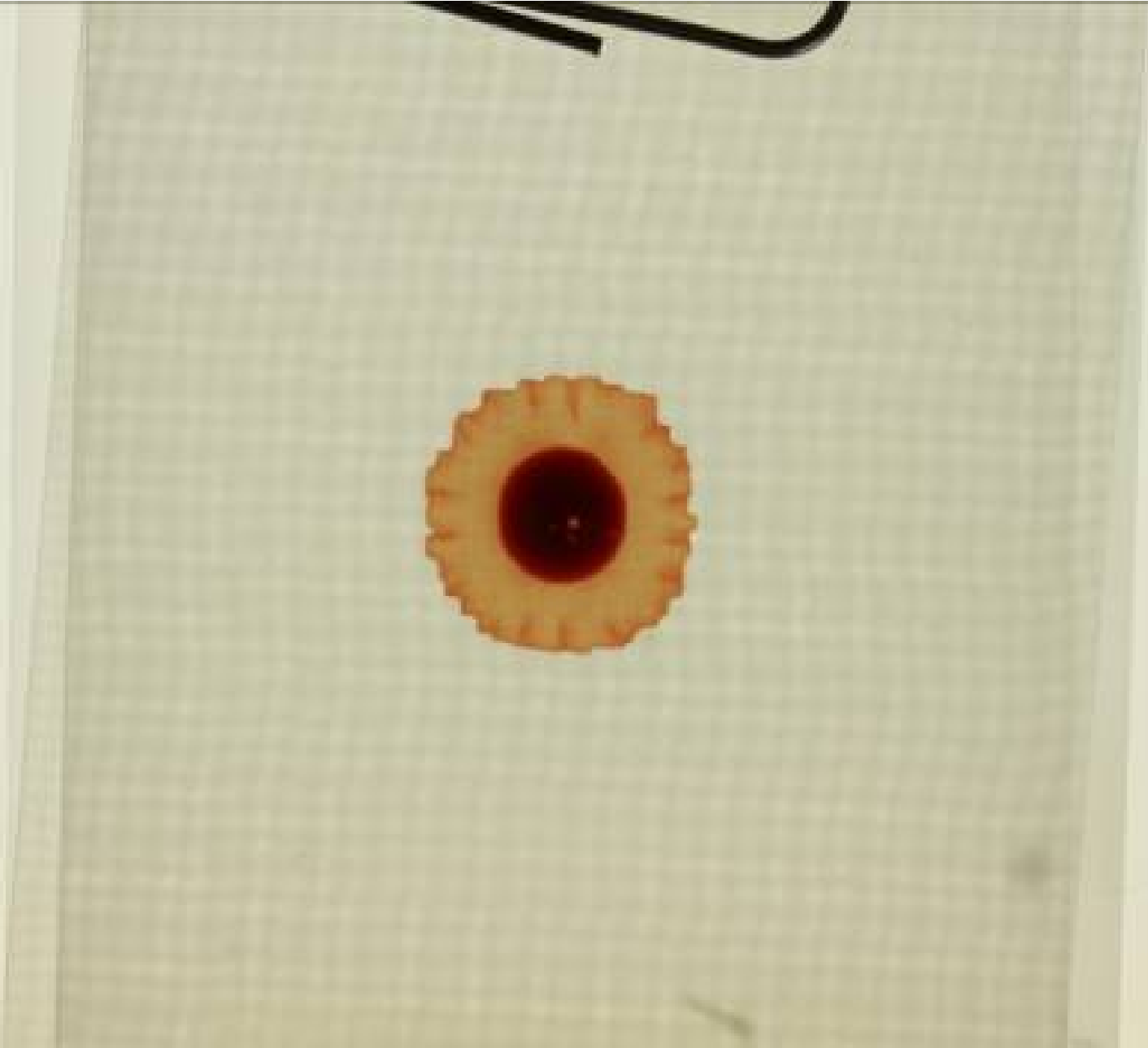
# How does our new material work

- Woven polyester material, fiber and mesh size in  $\mu\text{m}$  range
  - Large enough to transfer blood cells and small enough to retain dried blood
- Multi layers
  - Typically eight layers, spot size relates to number of layers
- Coated with a very hydrophilic coating and UV cured





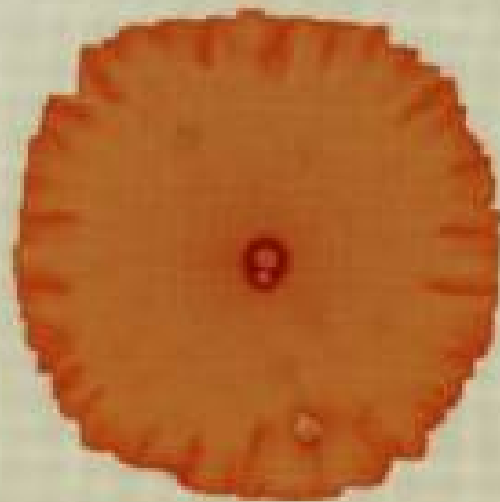










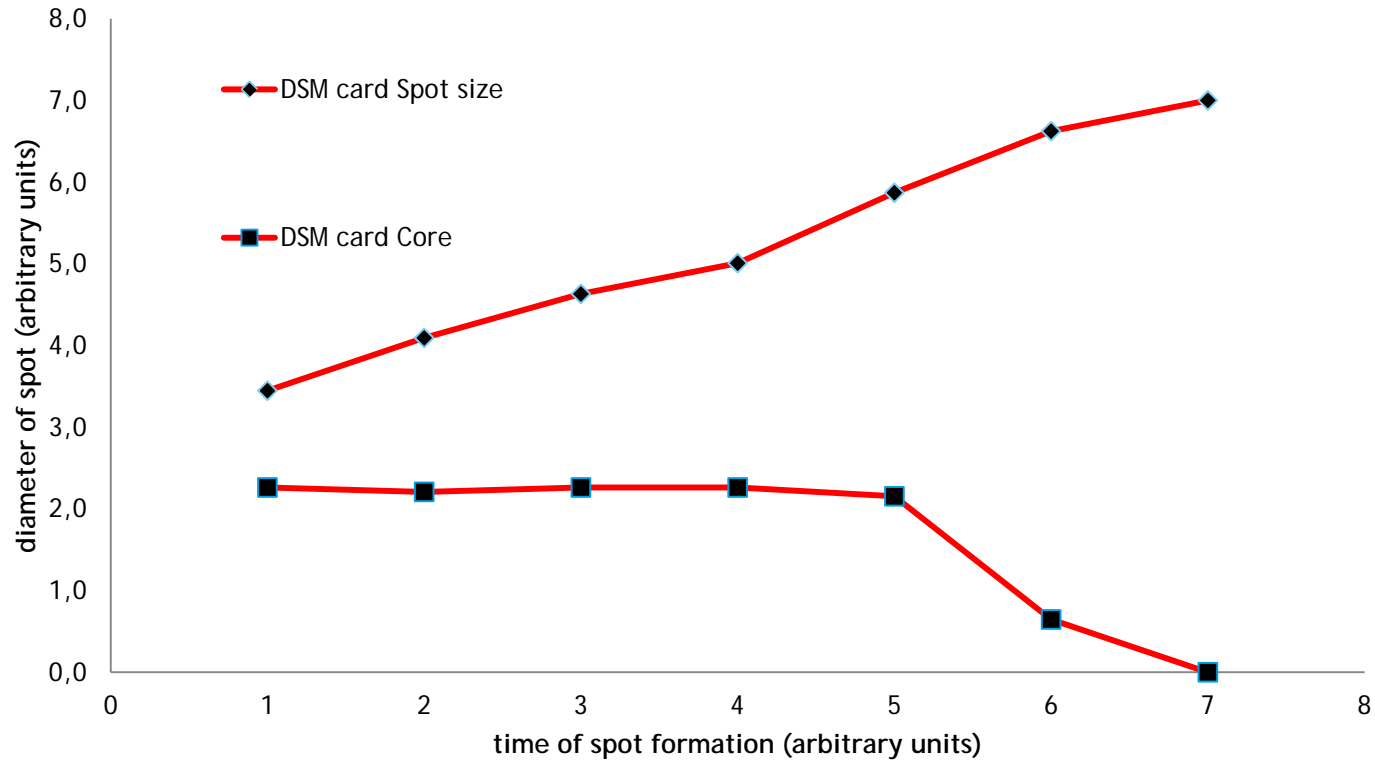


After a few seconds

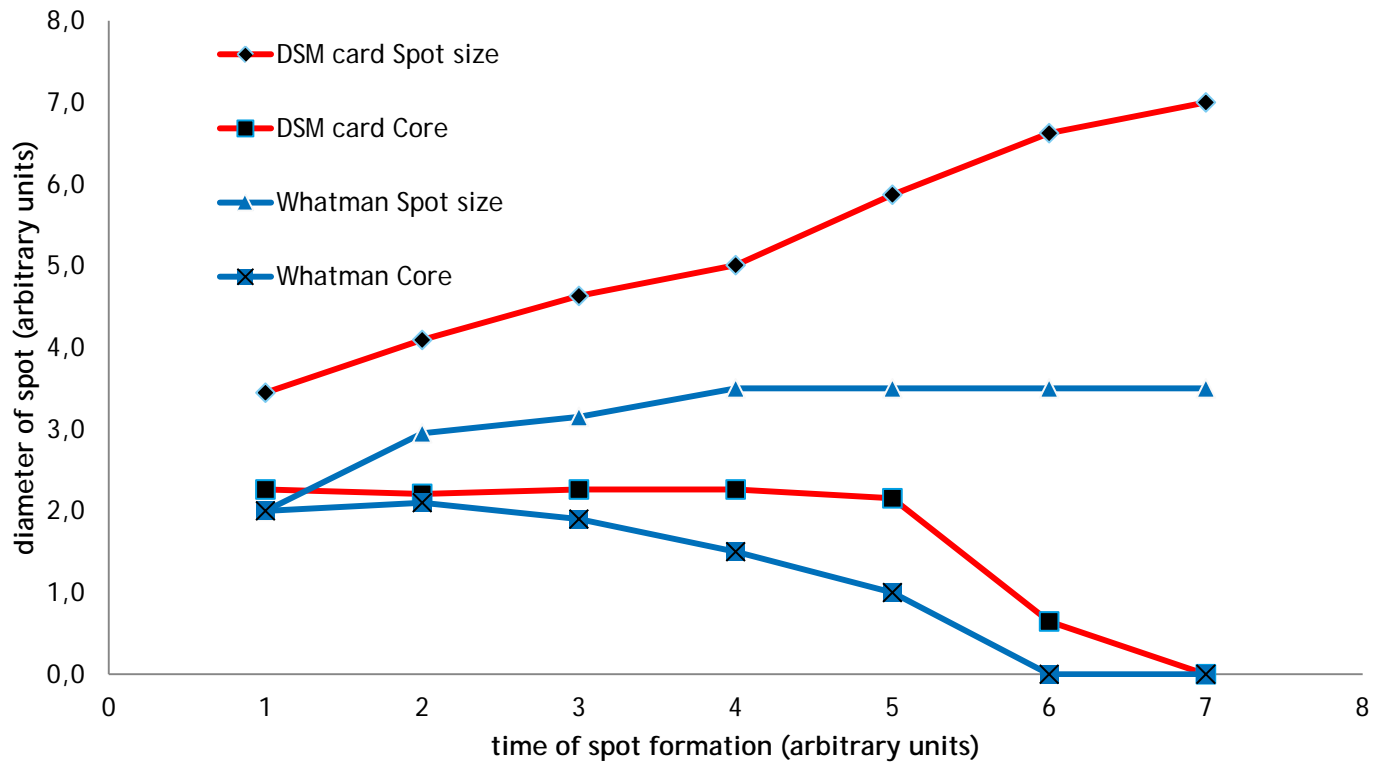


After a few minutes

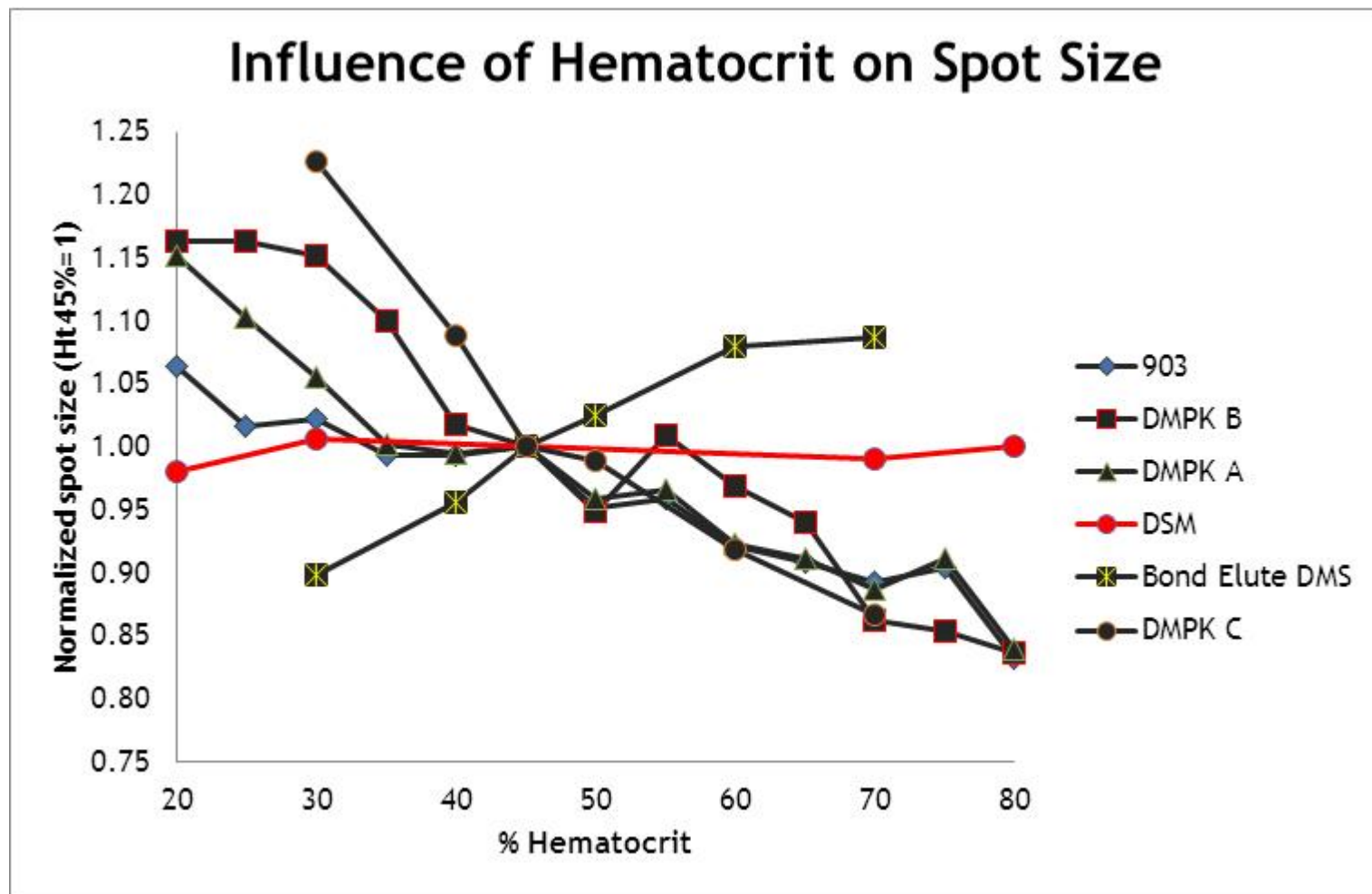
# Bloodspot spreading



# Bloodspot spreading



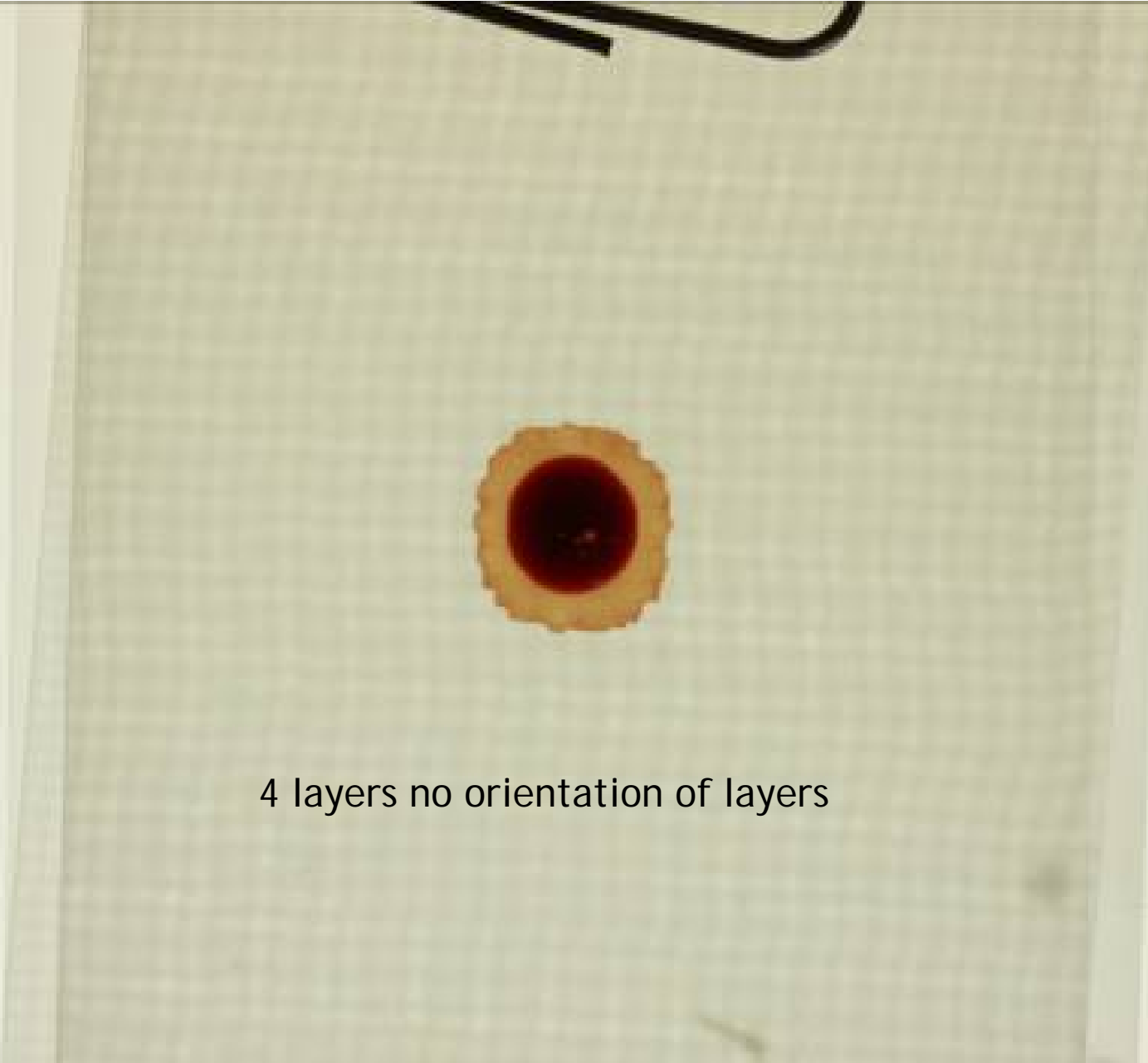
# Influence of Hematocrit



So, this looks like a holy grail to reduce study animals ??

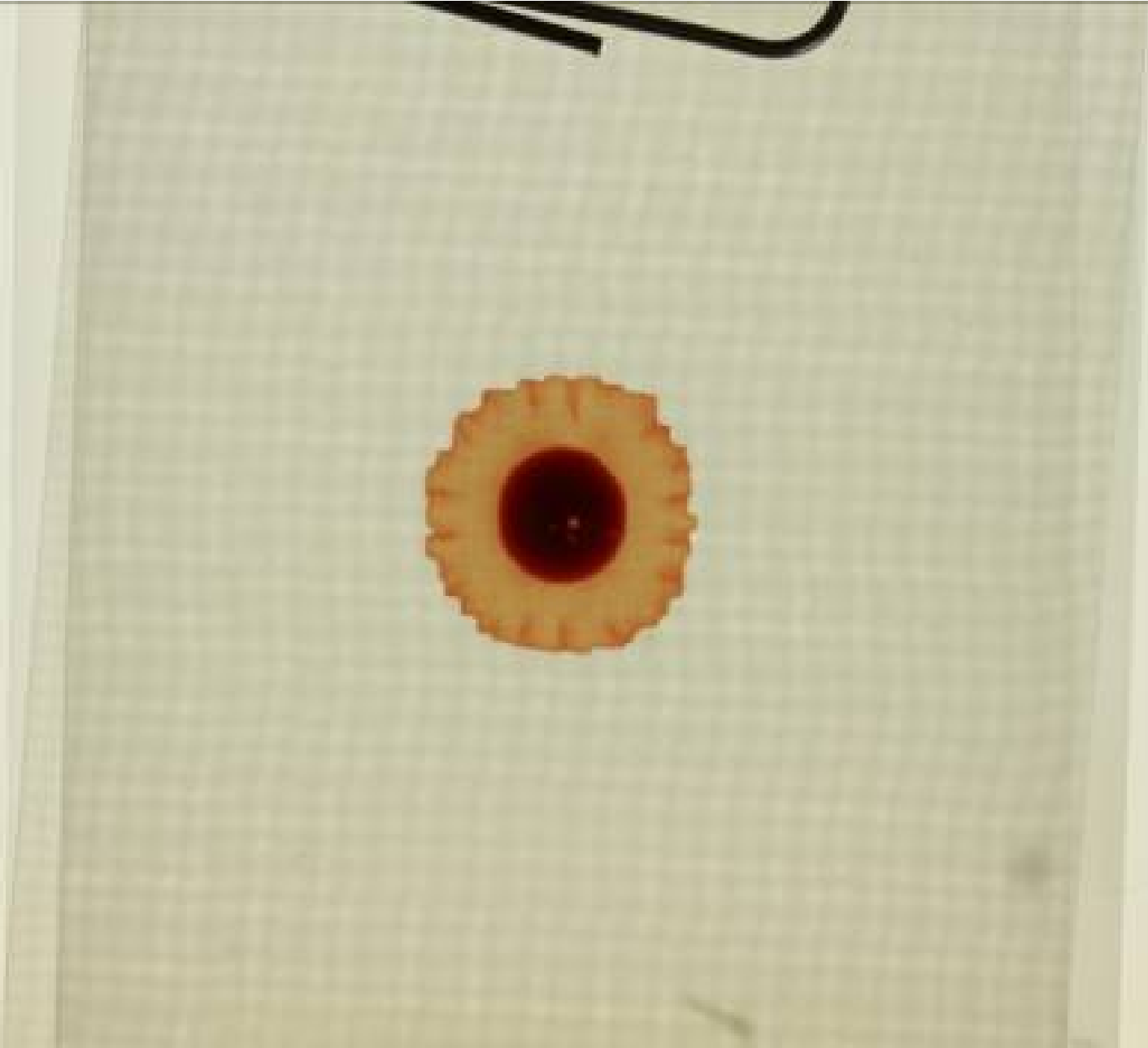






4 layers no orientation of layers







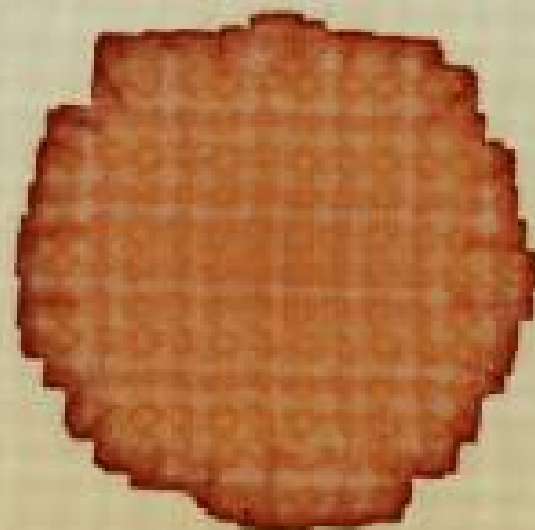




After a few seconds

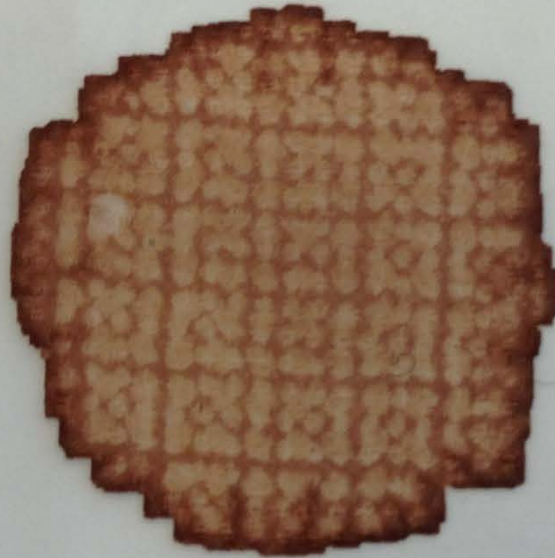


After a few minutes



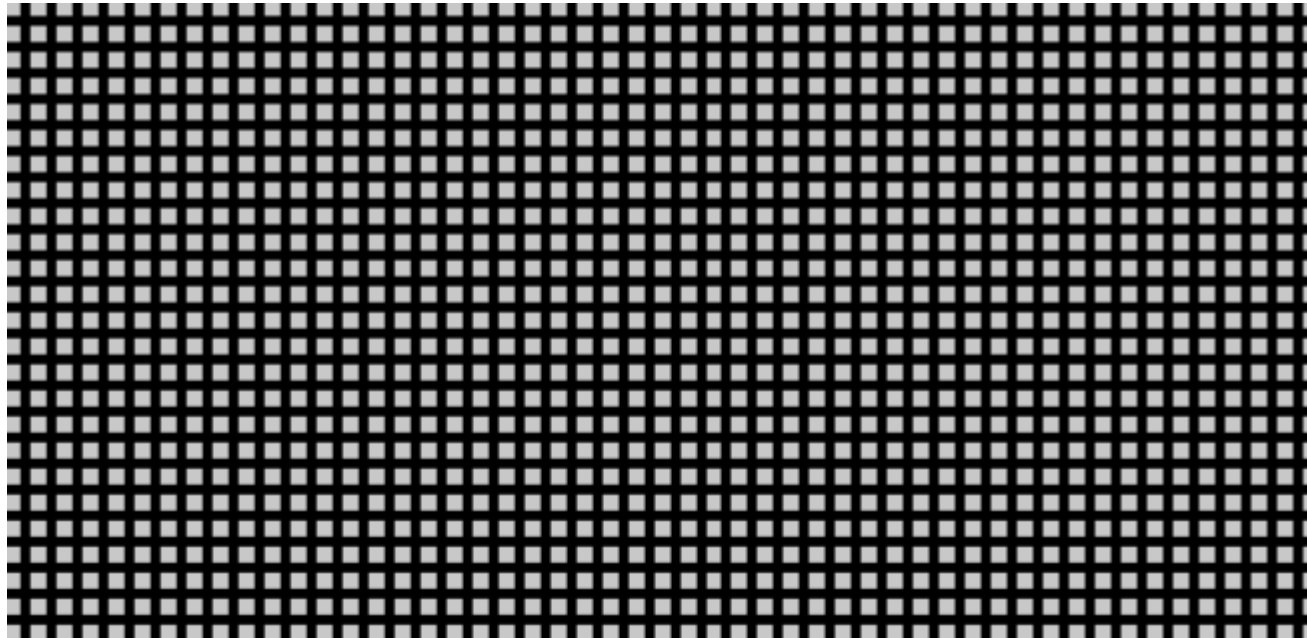
After an hour



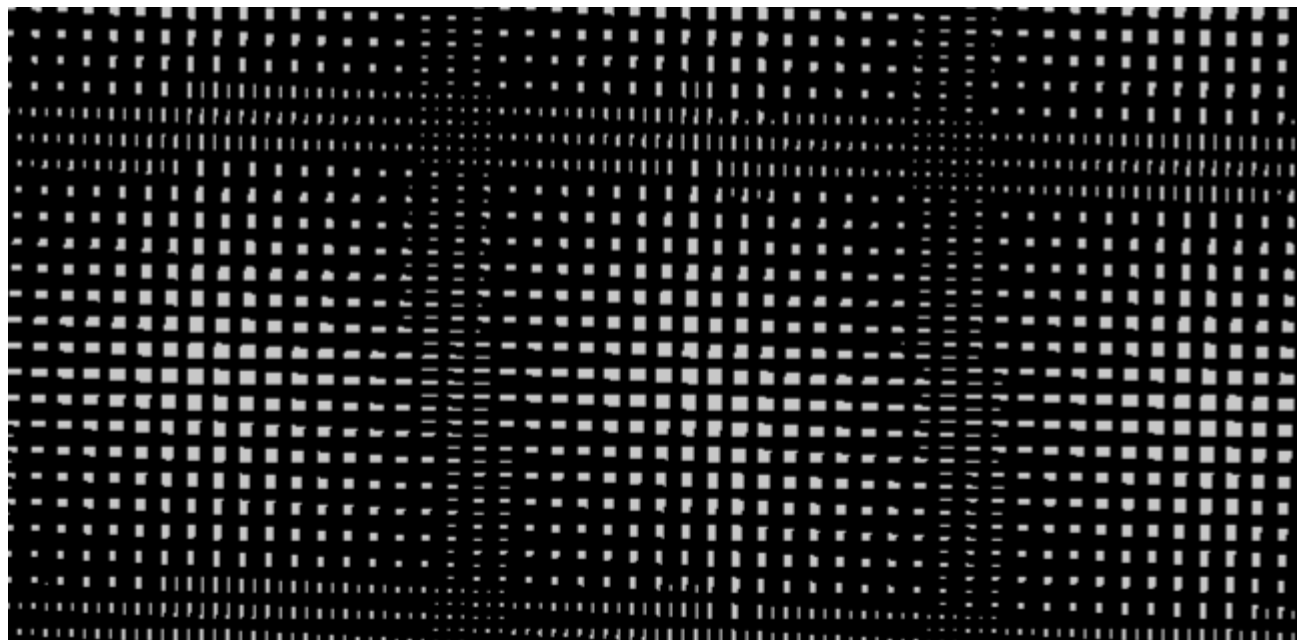


Single layer - aged blood

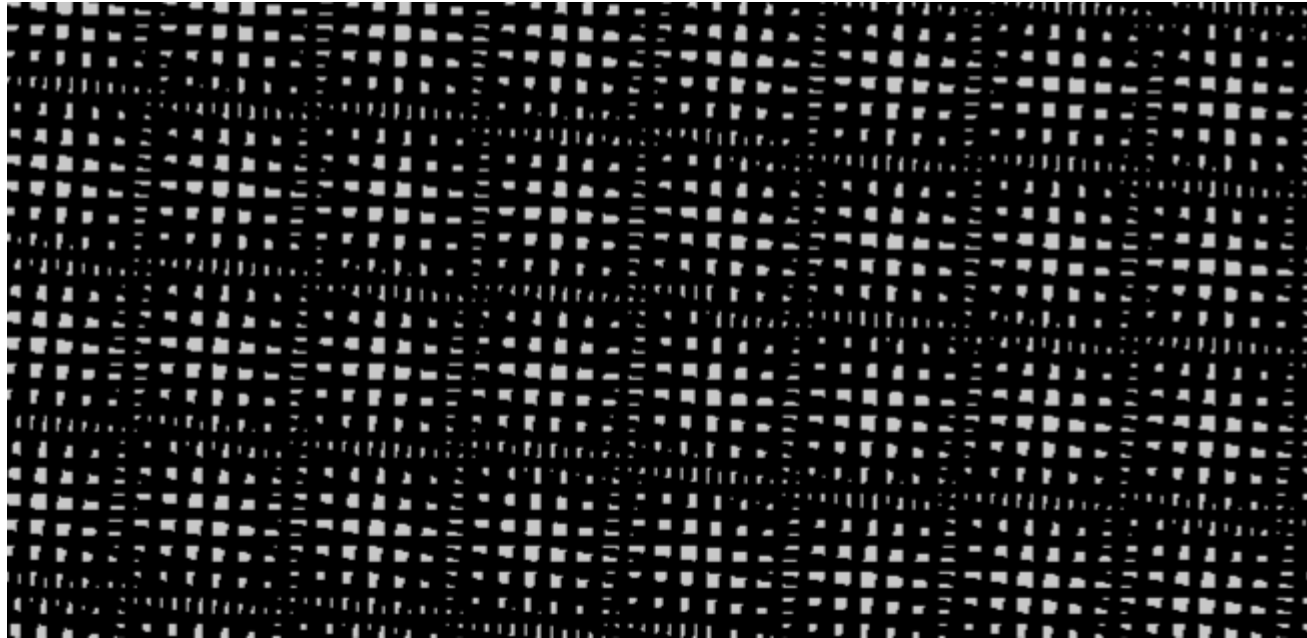
# 0 graden



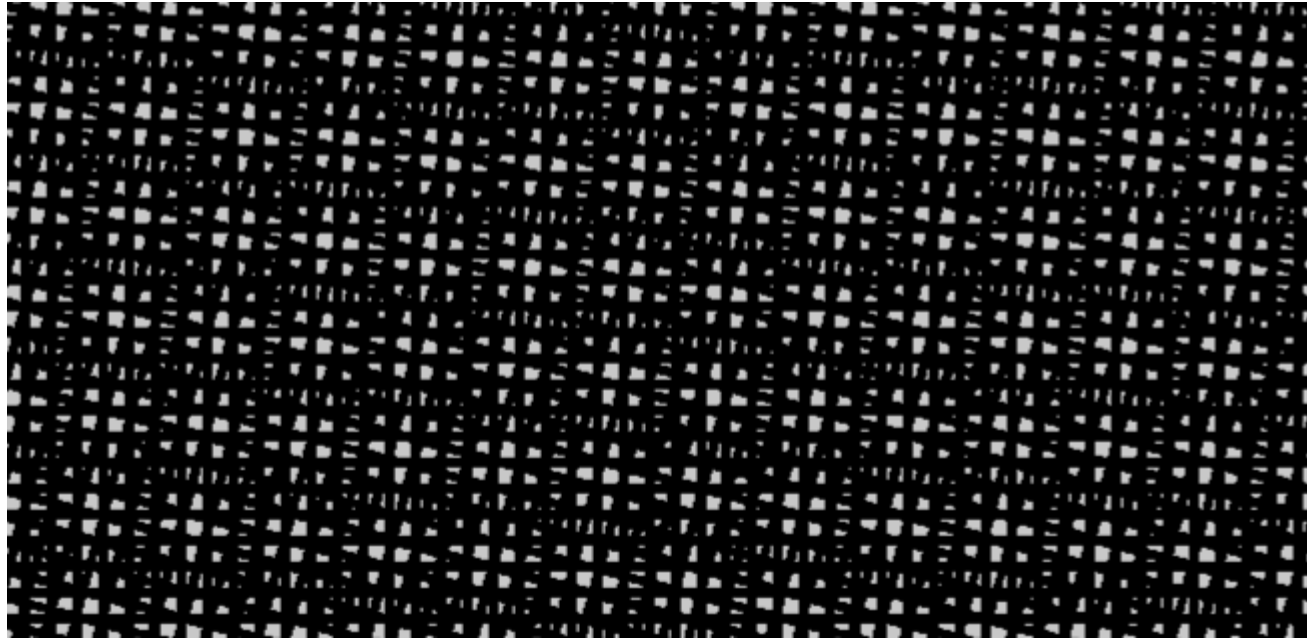
# 3 Degrees angle



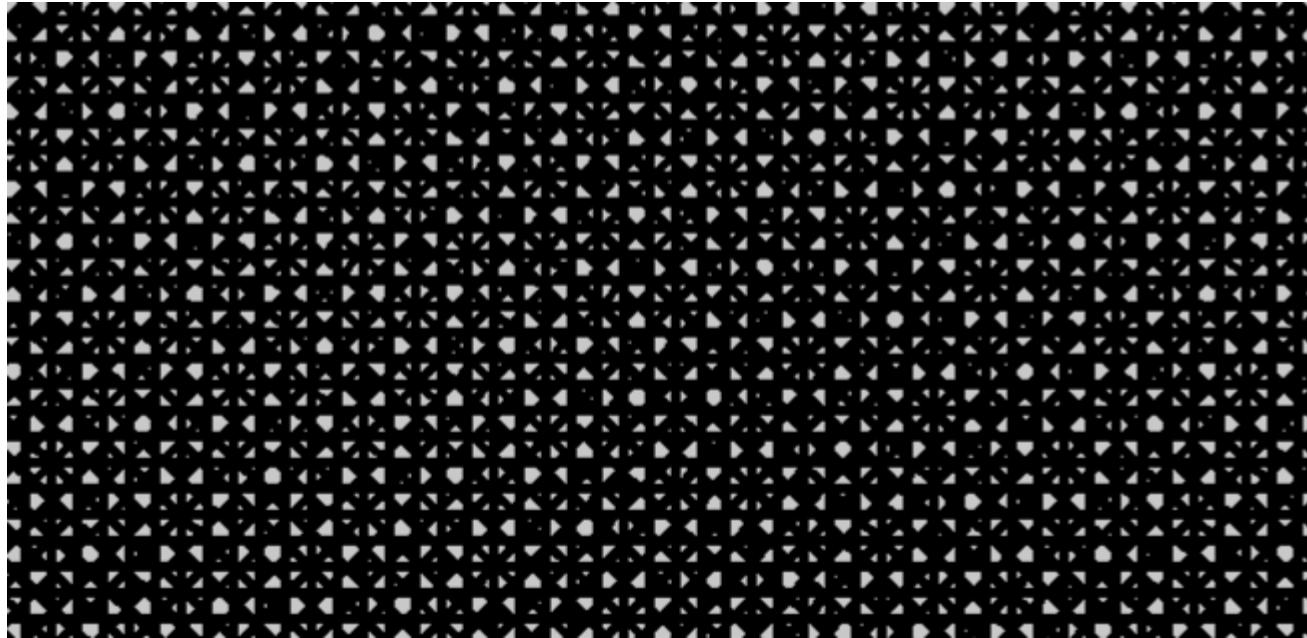
# 10 graden



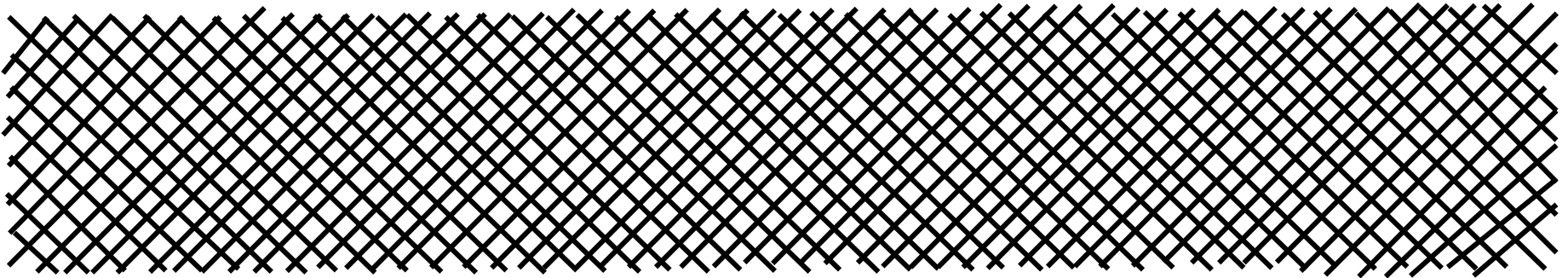
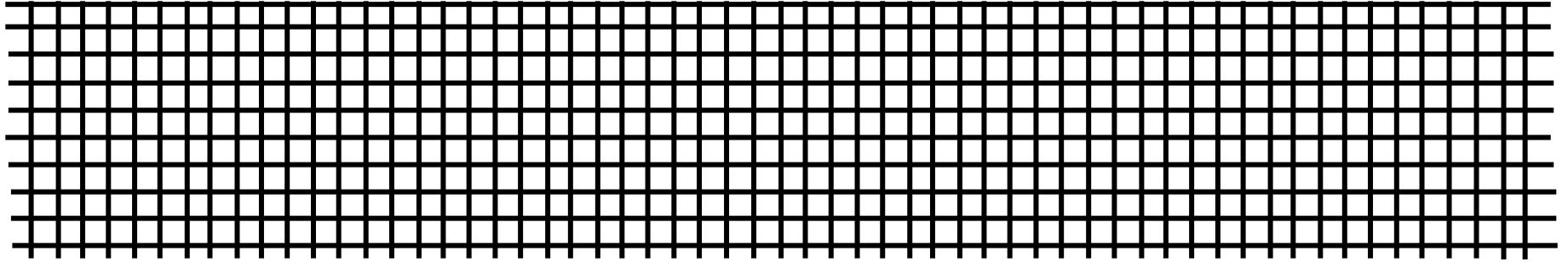
# 15 graden



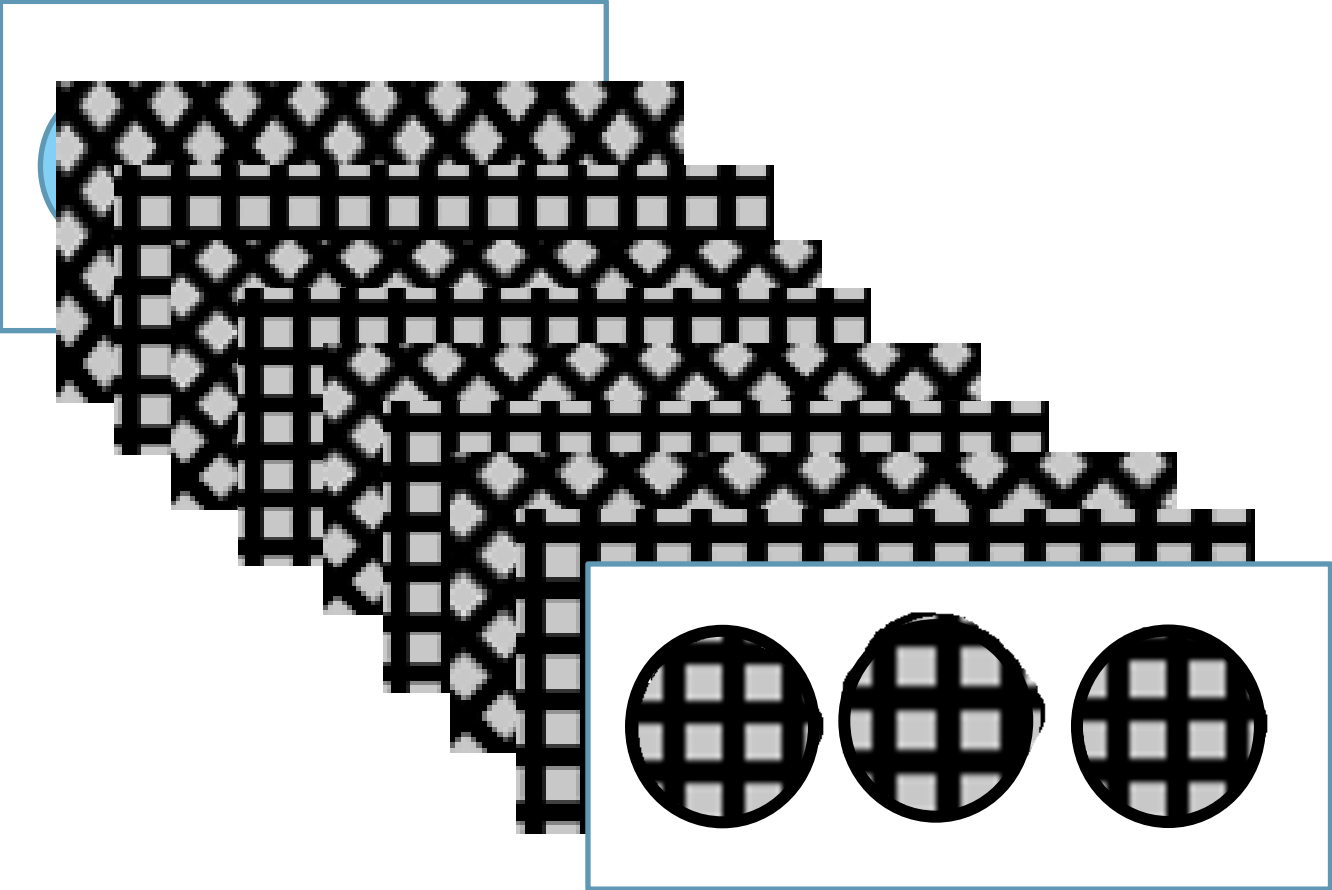
# 45 graden



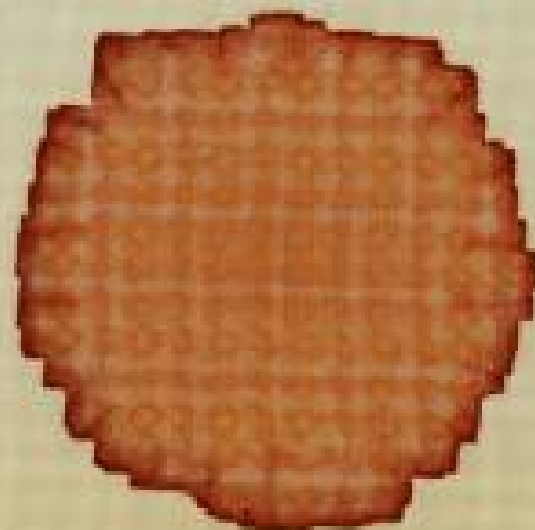
# Orientation of layers



# How the card is build







Not orientated material



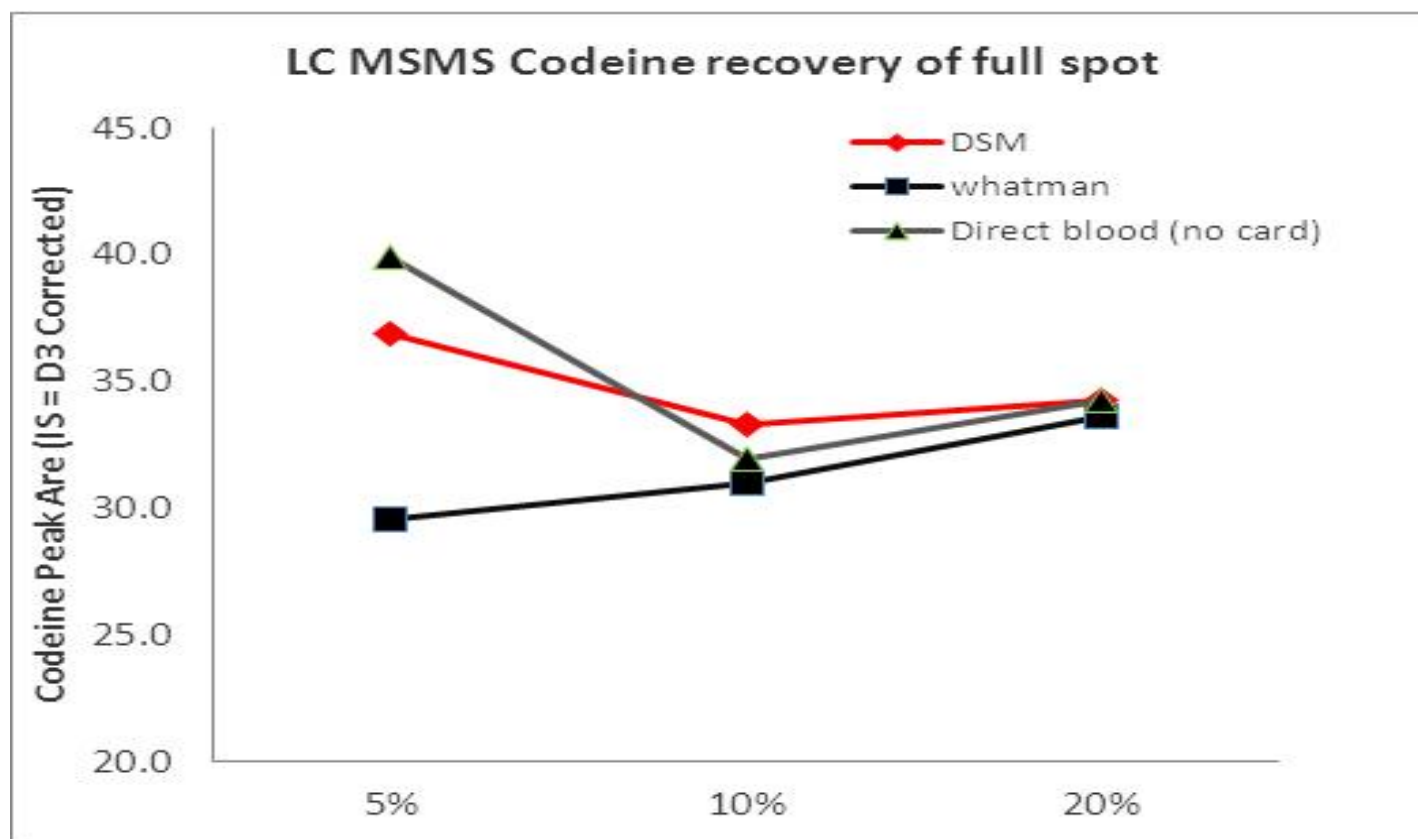
Orientated material

# Results: Spot Homogeneity

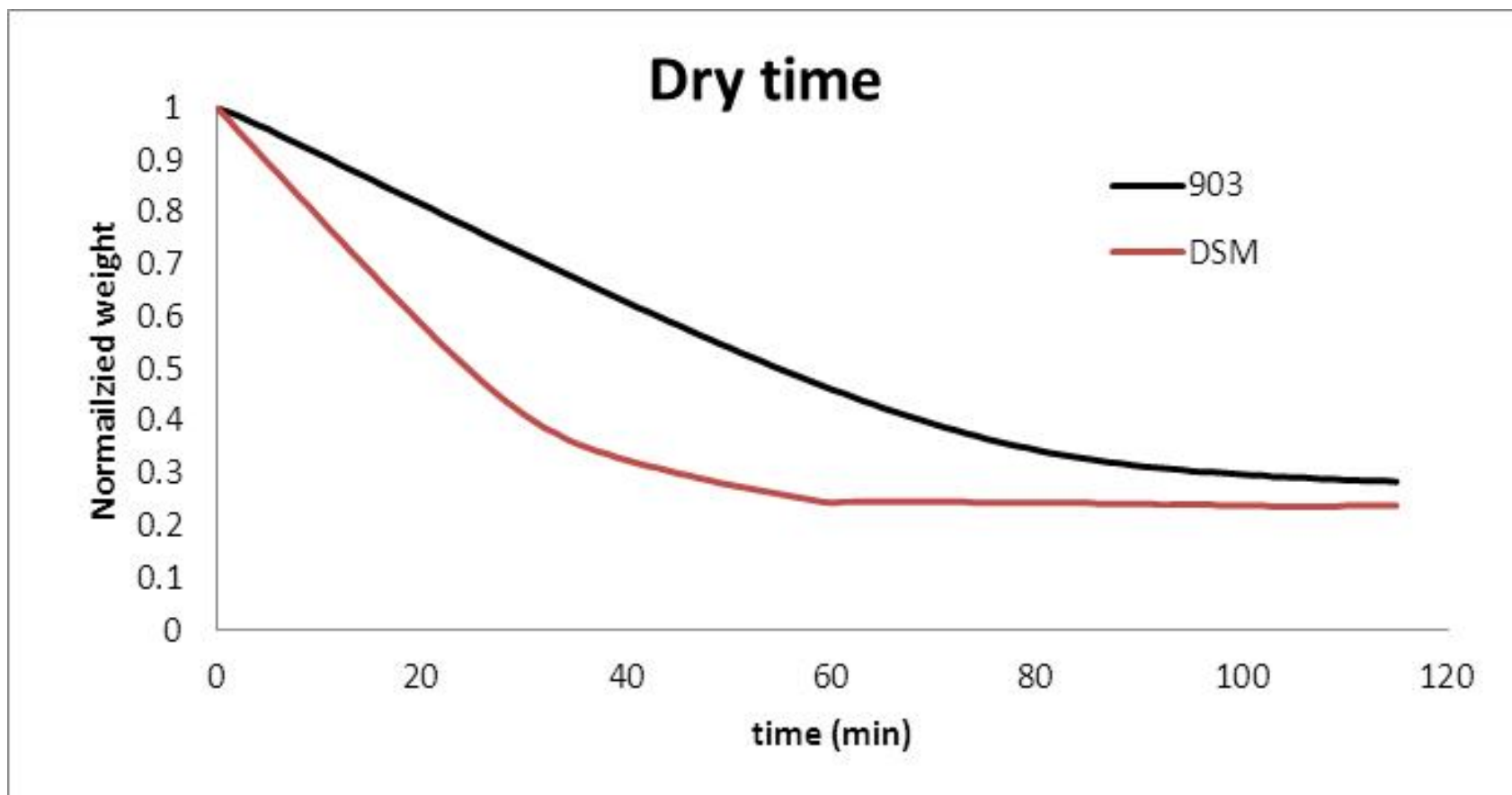
LCMSMS	Card 1			Card 2			AVG	RSD
	SPOT 1	SPOT 2	SPOT 3	SPOT 4	SPOT 5	SPOT 6		
MIDDLE	10.1	9.7	9.8	9.8	10.3	10.4	10.0	3
LEFT	10.4	9.9	10.1	10.3	10.2	9.4	10.1	3
RIGHT	10.8	10.7	10.4	11.7	11.5	10.7	11.0	5
DOWN	11.1	11.0	11.7	10.1	9.9	11.1	10.8	7
AVG	10.6	10.3	10.5	10.5	10.4	10.4	Average	10.47
RSD	4	6	8	8	7	7	RSD (n=24)	6



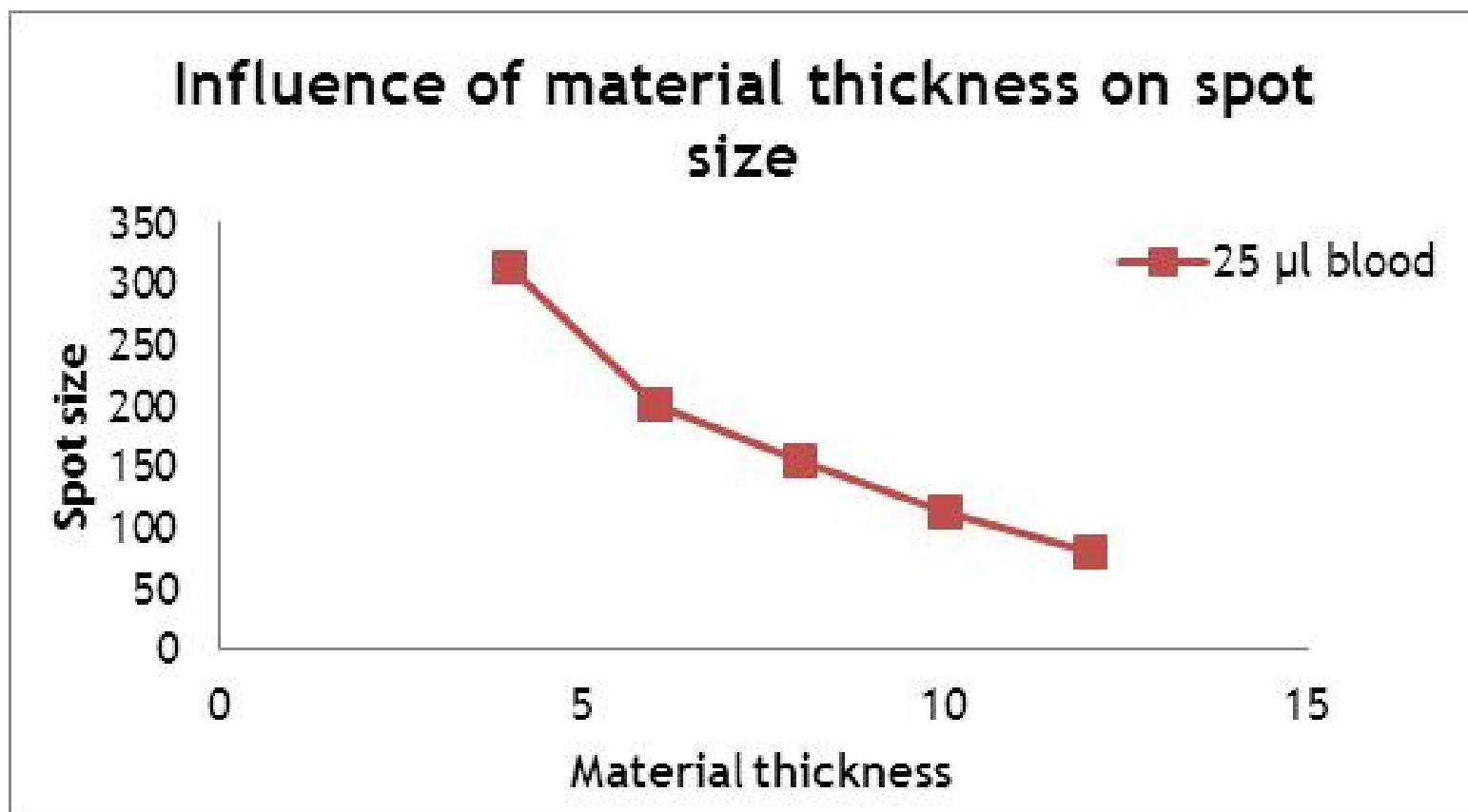
# Results: Recovery from full spot



# Results: Dry time



# Results: Tunable spot size



# Results: External tests

Test at GSK confirmed excellent spot size independency towards Hematocrit,  
but some preliminary results of tests between whole and punched spot show biased results and are under investigation.



# Conclusions

- Very interesting new material, shows spot sizes, which are independent of hematocrit value of the blood sample
- Fixed spot size at exact volume, as a consequence, blood volume on card can be determined on spot size.
- Two patents in place (card and coating)
- A startup company is being established, to commercialize this product





# Acknowledgements

- DSM: Jun Qiu (our 007), Ellen Gorissen, Nik de Bont and John Mommers
- Chemelot: Odile Steijger, Henri Theunissen and Bert Kip
- Ministry of Economic Affairs

If they could only analyze my blood on a DBS card, without to worry about the Ht effect

