



quality data package

AZ MIR 701 (14CPS)

Comparing POR version vs PFOA-free version

Date: July 2020

Confidential Information



MERCK



01

PROCESS PARAMETERS

Process parameters

Developer AZ 326 MIF

PCN 14cps
PFOA-free 14cps

	Developer AZ 326 MIF	
Substrate	Si wafer (HMDS primed)	
Film thickness	0.918 μm by single coat	
Softbake	90 °C / 90 s (prox. Hotplate)	
Exposure tool	Nikon i-line stepper NA = 0.54	
Post exposure bake	115 °C / 90 s (prox. Hotplate)	
Developing	1 x 60 s puddle	
Resist type	POR 14cps	PFOA-free 14cps
Exposure	115 mJ/cm² 1:1 @ L/S 0.45 μm (CD-SEM, top down)	110 mJ/cm² 1:1 @ L/S 0.45 μm (CD-SEM, top down)





02

spin curve

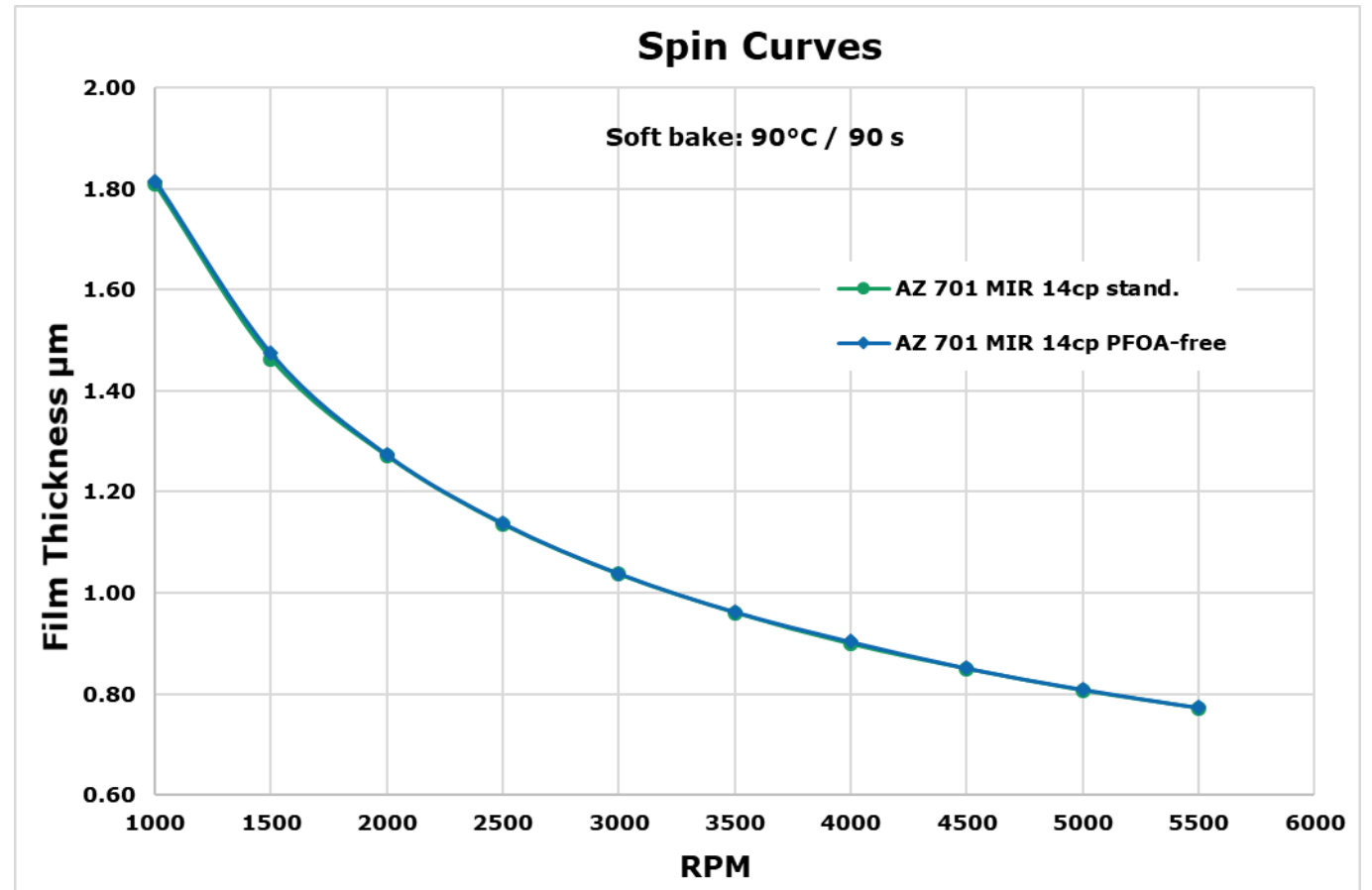
(POR VS PFDA-free)

AZ MIR 701 (14cps)

POR vs PFOA-free

Spin curve comparison

	F/T (μm)	POR 14cps	PFOA-free 14cps
RPM	1000	1.81	1.82
	1500	1.46	1.47
	2000	1.27	1.27
	2500	1.14	1.14
	3000	1.04	1.04
	3500	0.96	0.96
	4000	0.90	0.90
	4500	0.85	0.85
	5000	0.81	0.81
	5500	0.77	0.77



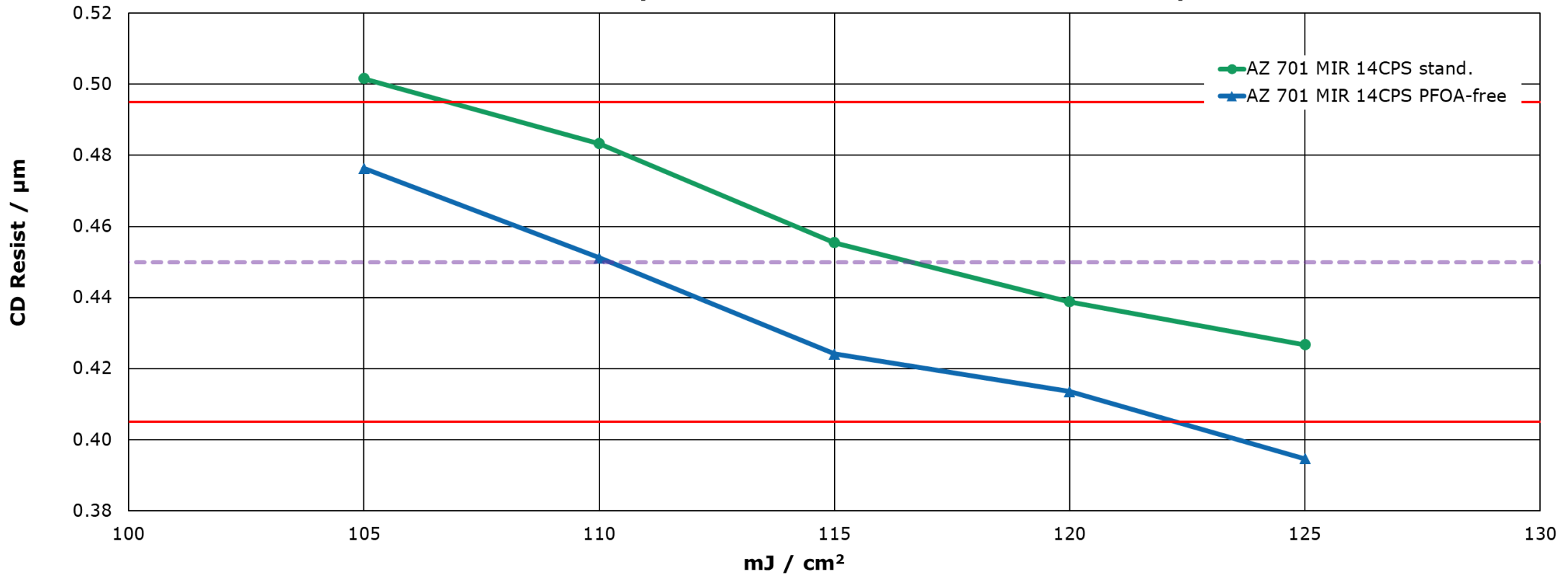
03

EXPOSURE Latitude

Developer AZ 326 MIF

Exposure Latitude
Focus -1.6 μm

AZ 701 MIR 14cps stand.: 115 mJ/cm^2 @ 1:1 CD 0.45 μm
AZ 701 MIR 14cps PFOA-free.: 120 mJ/cm^2 @ 1:1 CD 0.45 μm



Note: this measurement has been pursued in Wiesbaden. Therefore, applied tools and methods are not identical to those utilized as specified in the CoA by the original source.

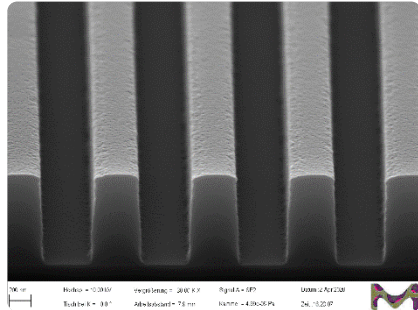


AZ MIR 701 (14cps) POR vs PFOA-free

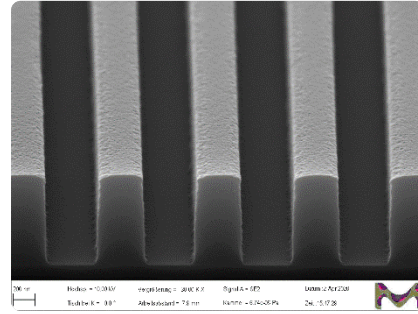
Exposure Latitude (AZ 326 MIF) CD: 0.45 μm

AZ MIR 701
14 CPS
POR

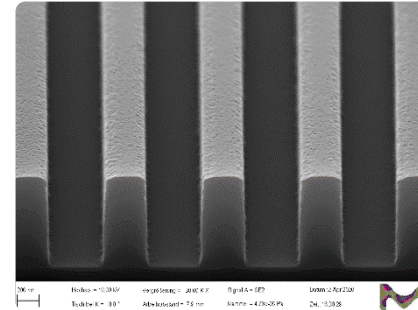
Exposure: 110 mJ/cm²



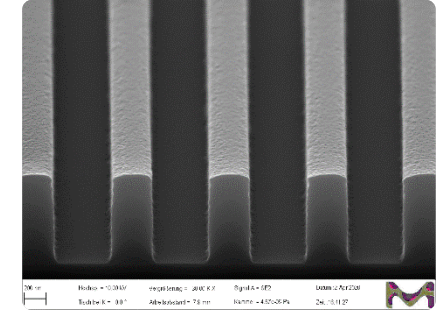
Exposure: 115 mJ/cm²



Exposure: 125 mJ/cm²

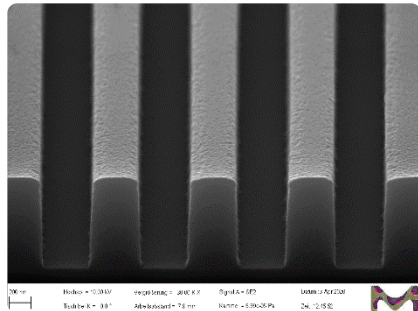


Exposure: 130 mJ/cm²

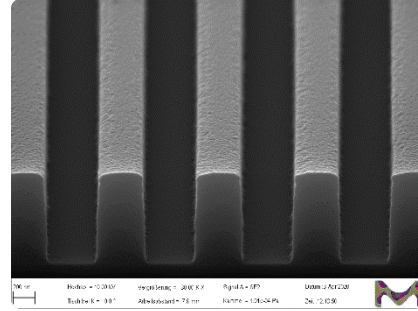


AZ MIR 701
14 CPS
PFOA-Free

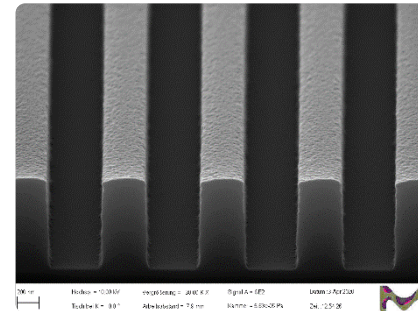
Exposure: 105 mJ/cm²



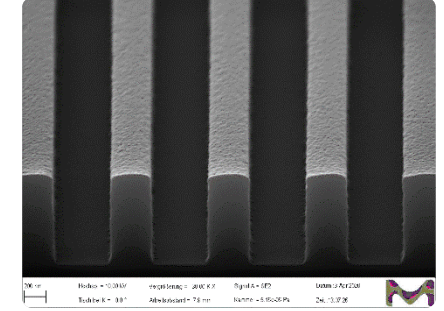
Exposure: 110 mJ/cm²



Exposure: 115 mJ/cm²



Exposure: 120 mJ/cm²





Linearity

Developer AZ 326 MIF

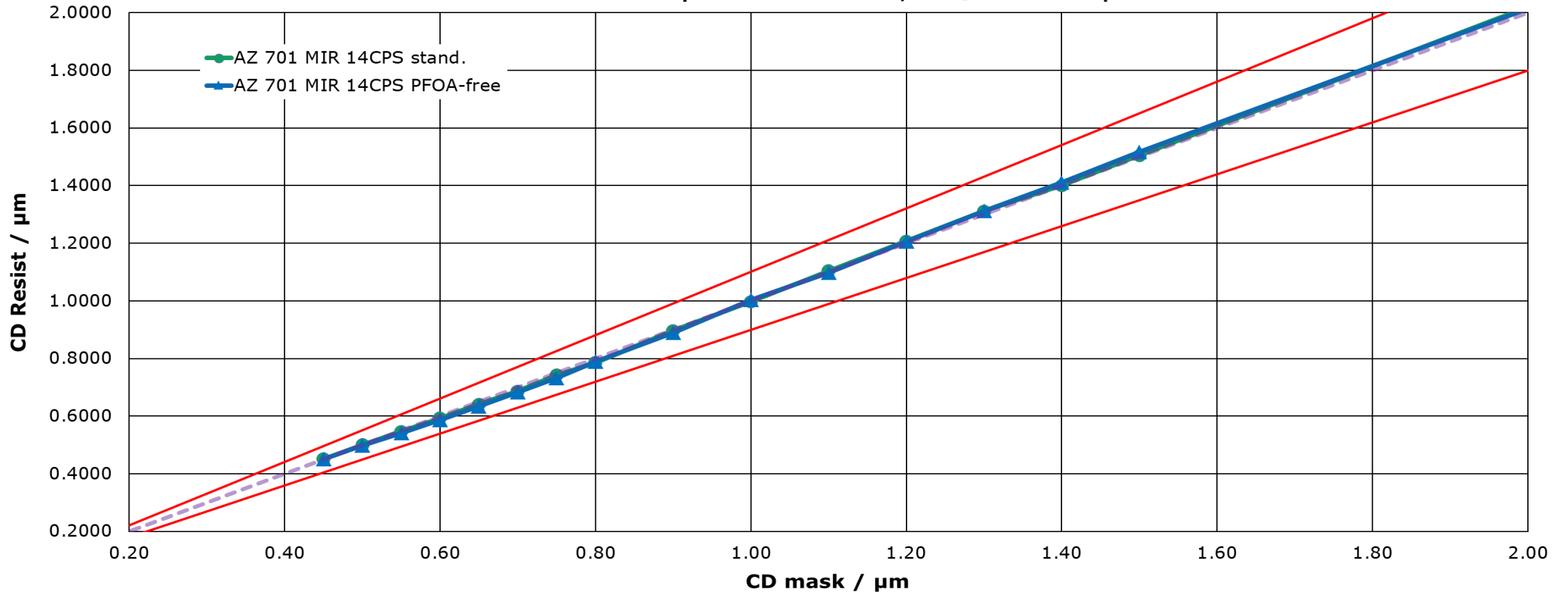
AZ MIR 701 (14cps)

POR vs PFOA-free

Linearity (AZ 326 MIF)

Linearity

AZ 701 MIR 14cps stand.: 115 mJ/cm² @ 1:1 CD 0.45 μm
AZ 701 MIR 14cps PFOA-free: 110 mJ/cm² @ 1:1 CD 0.45 μm



AZ MIR 701 (14cps)

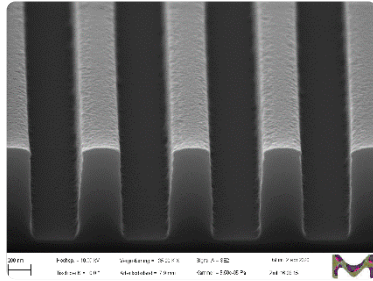
POR vs PFOA-free

Linearity (AZ 326 MIF)

AZ MIR 701
14 CPS
POR

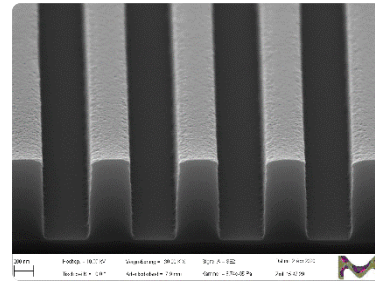
CD 0.40 μm

115 mJ/cm^2



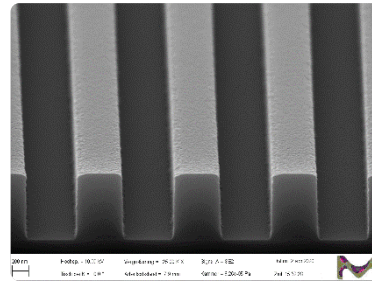
CD 0.45 μm

115 mJ/cm^2



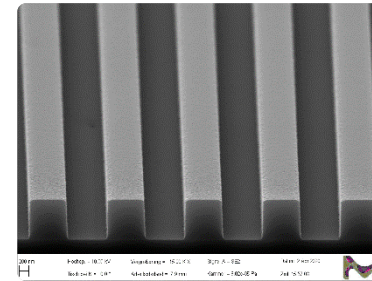
CD 0.60 μm

115 mJ/cm^2



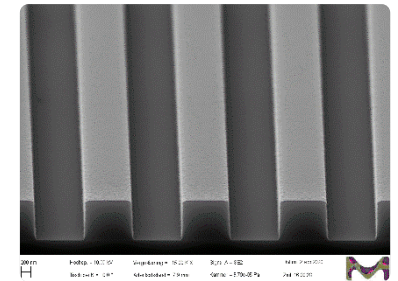
CD 0.80 μm

115 mJ/cm^2



CD 1.00 μm

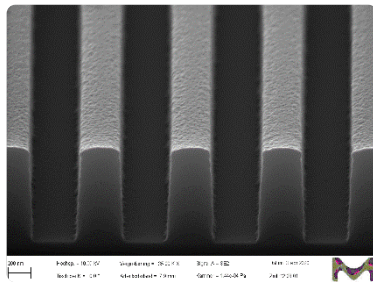
115 mJ/cm^2



AZ MIR 701
14 CPS
PFOA-Free

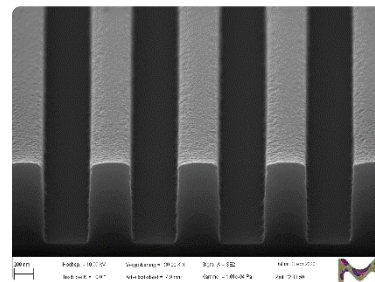
CD 0.40 μm

110 mJ/cm^2



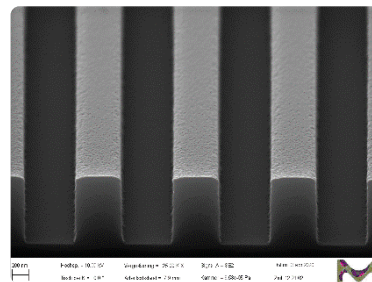
CD 0.45 μm

110 mJ/cm^2



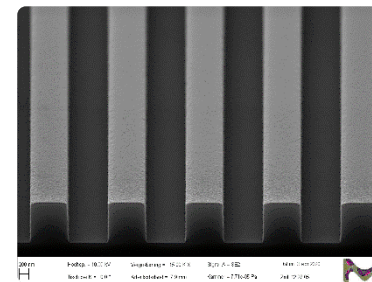
CD 0.60 μm

110 mJ/cm^2



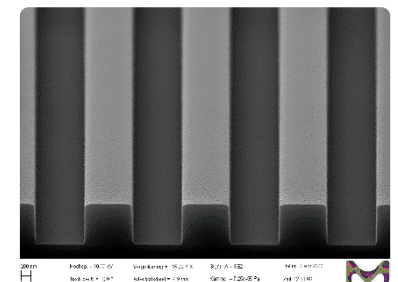
CD 0.80 μm

110 mJ/cm^2



CD 1.00 μm

110 mJ/cm^2





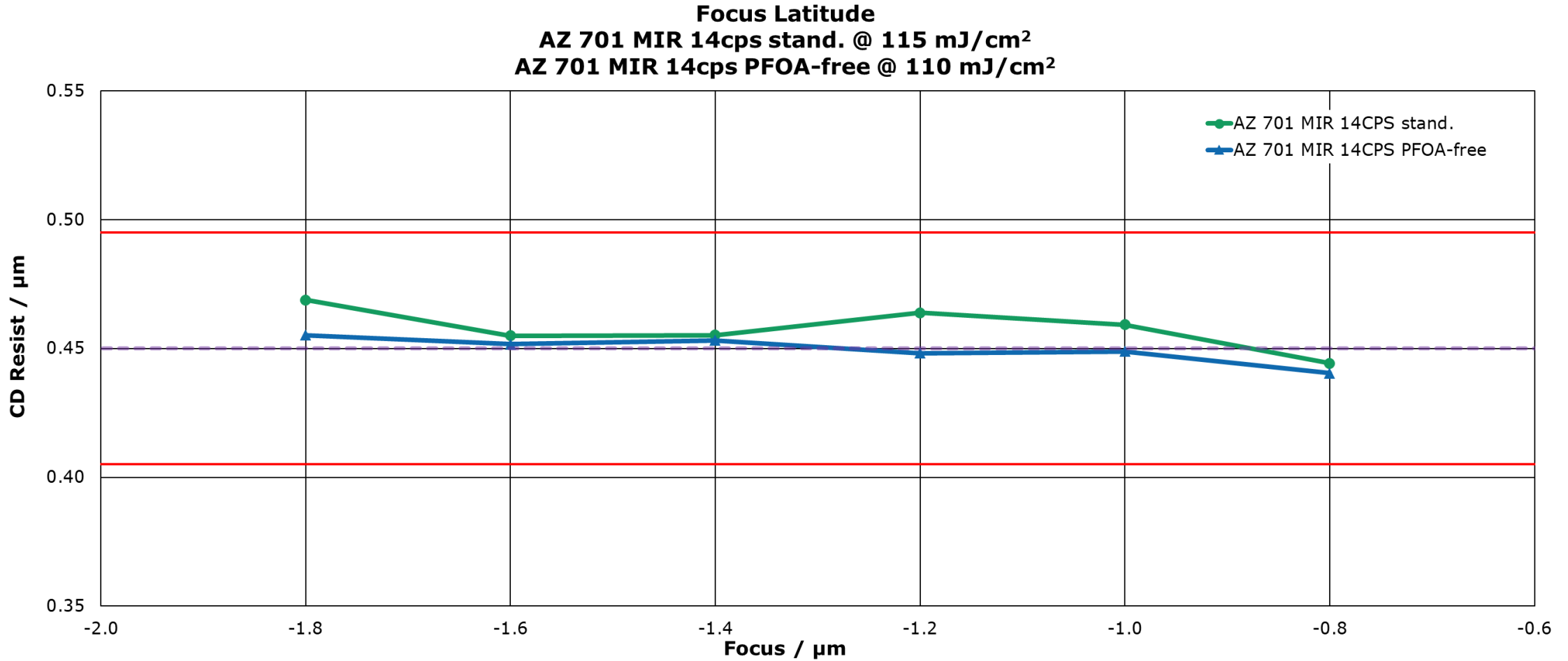
05

FOCUS Latitude

Developer AZ 326 MIF

AZ MIR 701 (14cps) POR vs PFOA-free

Focus Latitude (AZ 326 MIF) @CD 0.45 μm



AZ MIR 701 (14cps)

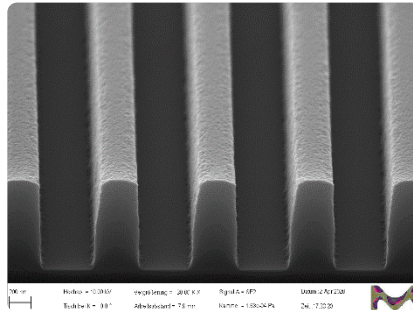
POR vs PFOA-free

Focus Latitude (AZ 326 MIF)

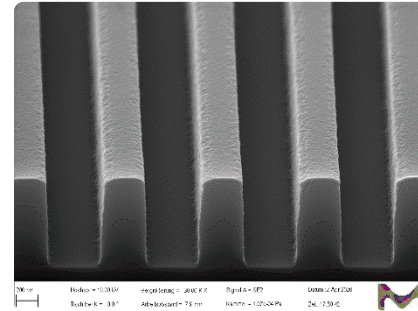
CD: 0.45 μm

AZ MIR 701
14 CPS
POR

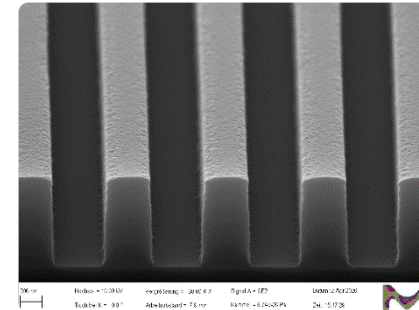
Exposure: 115 mJ/cm²
Focus - 0.8 μm



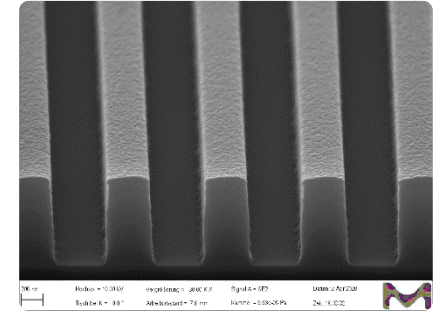
Exposure: 115 mJ/cm²
Focus - 1.2 μm



Exposure: 115 mJ/cm²
Focus - 1.6 μm

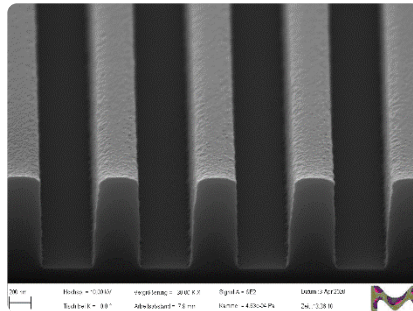


Exposure: 115 mJ/cm²
Focus - 1.8 μm

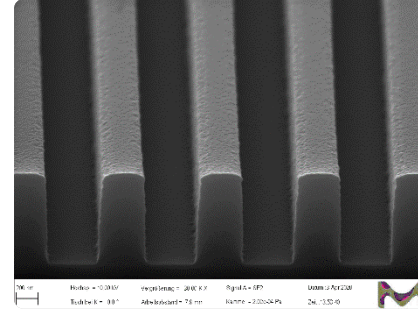


AZ MIR 701
14 CPS
PFOA-Free

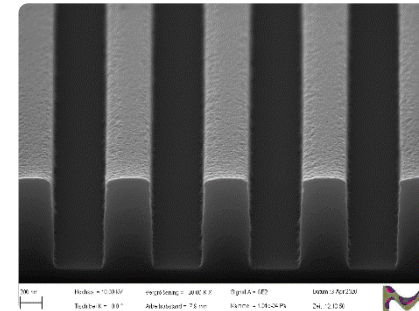
Exposure: 110 mJ/cm²
Focus - 0.8 μm



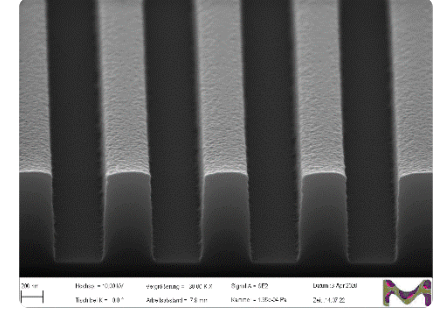
Exposure: 110 mJ/cm²
Focus - 1.2 μm



Exposure: 110 mJ/cm²
Focus - 1.6 μm



Exposure: 200 mJ/cm²
Focus - 1.8 μm

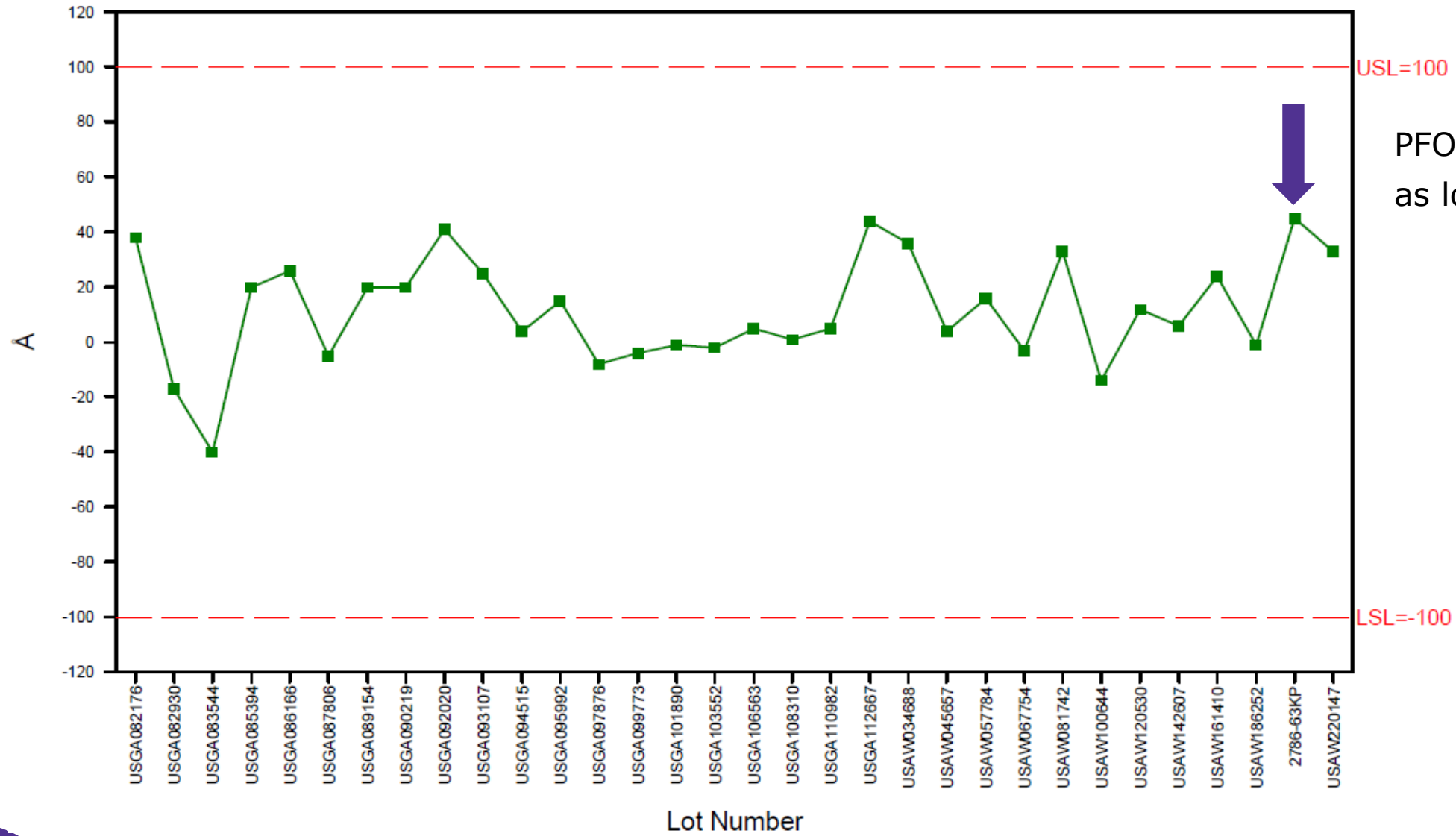




06

SPC CHARTS

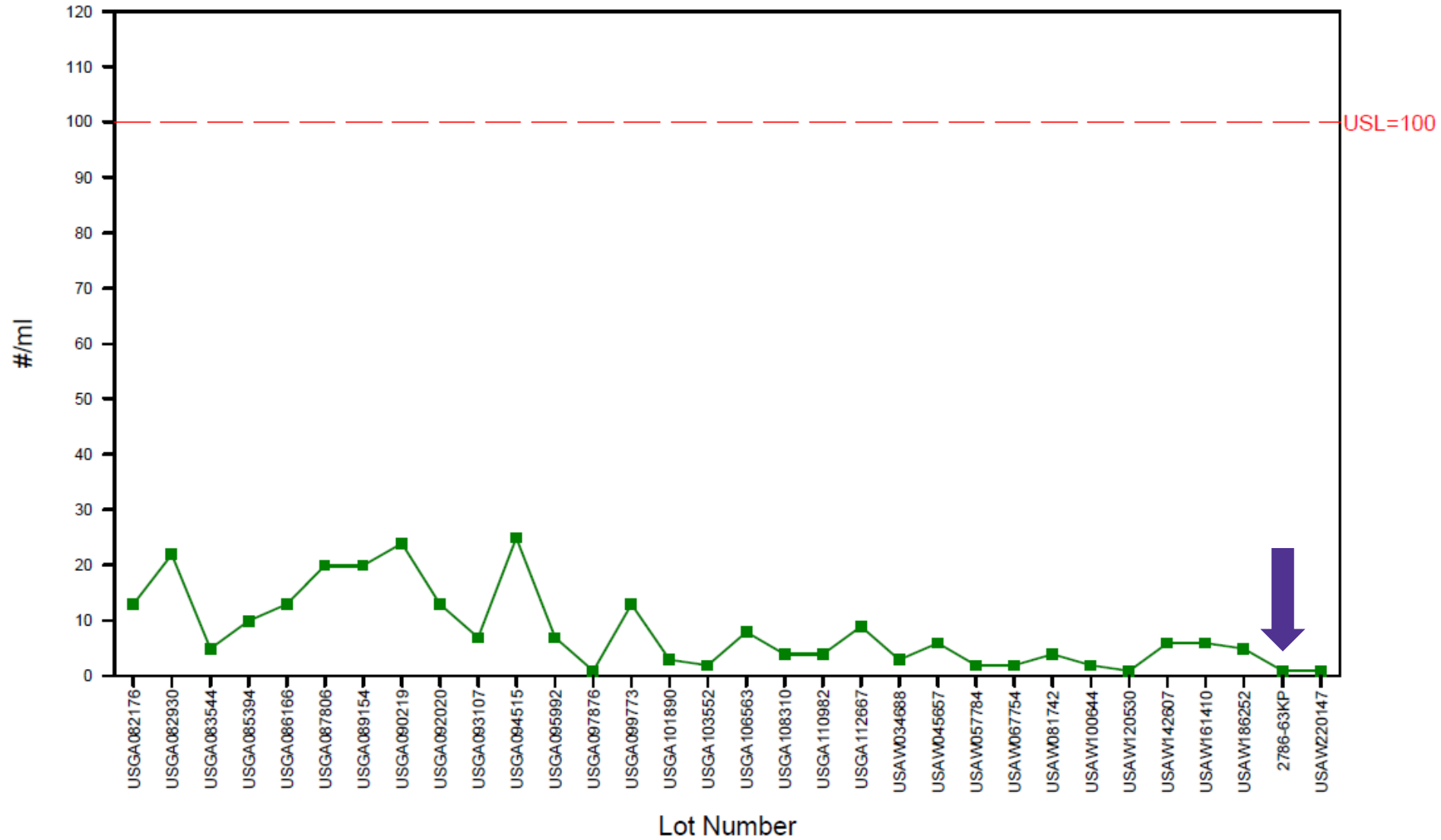
SPC Chart – Film Thickness vs. Reference



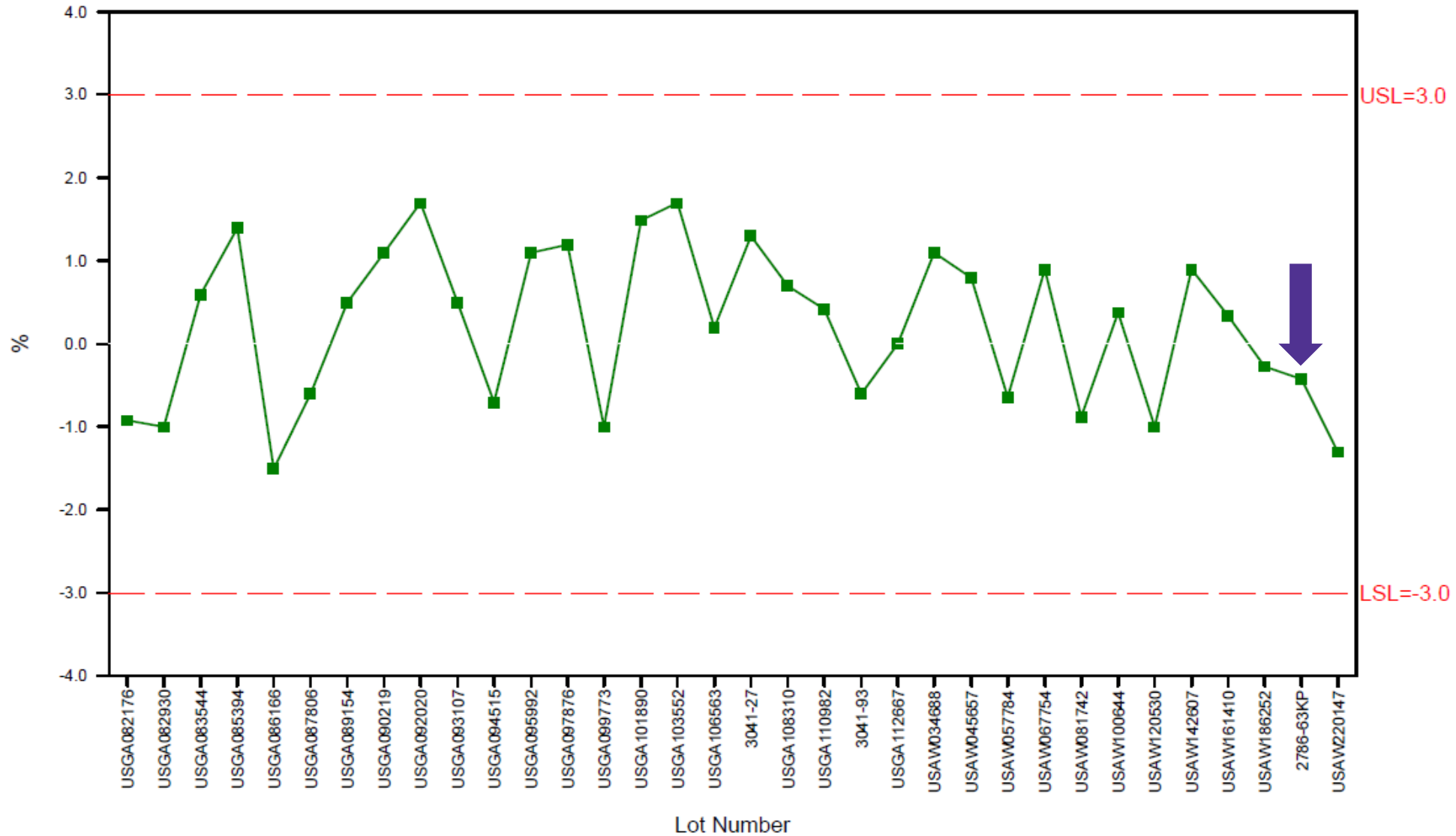
PFOA-free lot is shown as lot# 2786-63KP



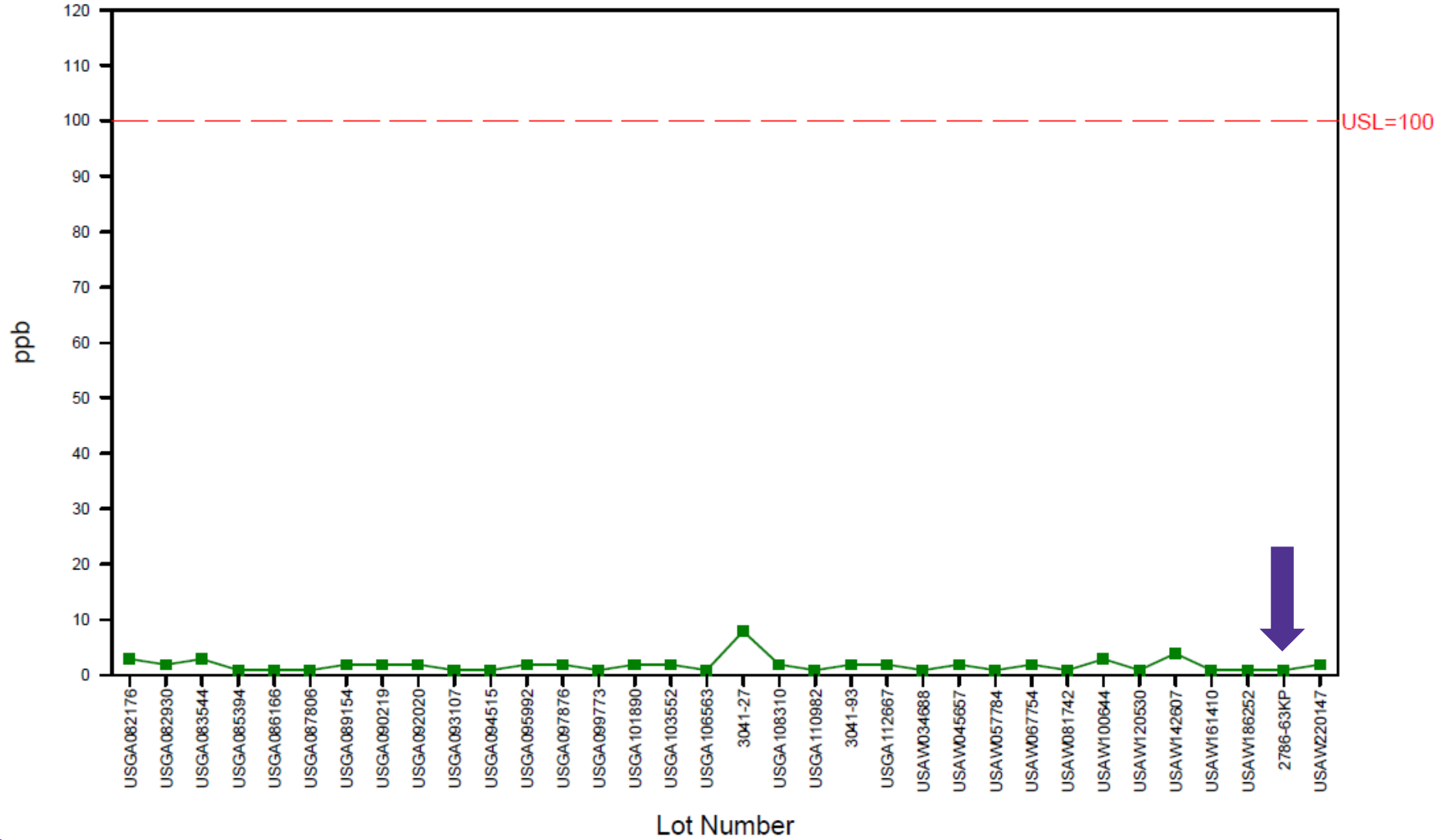
SPC Chart – Liquid Particle Counts > 0.3um



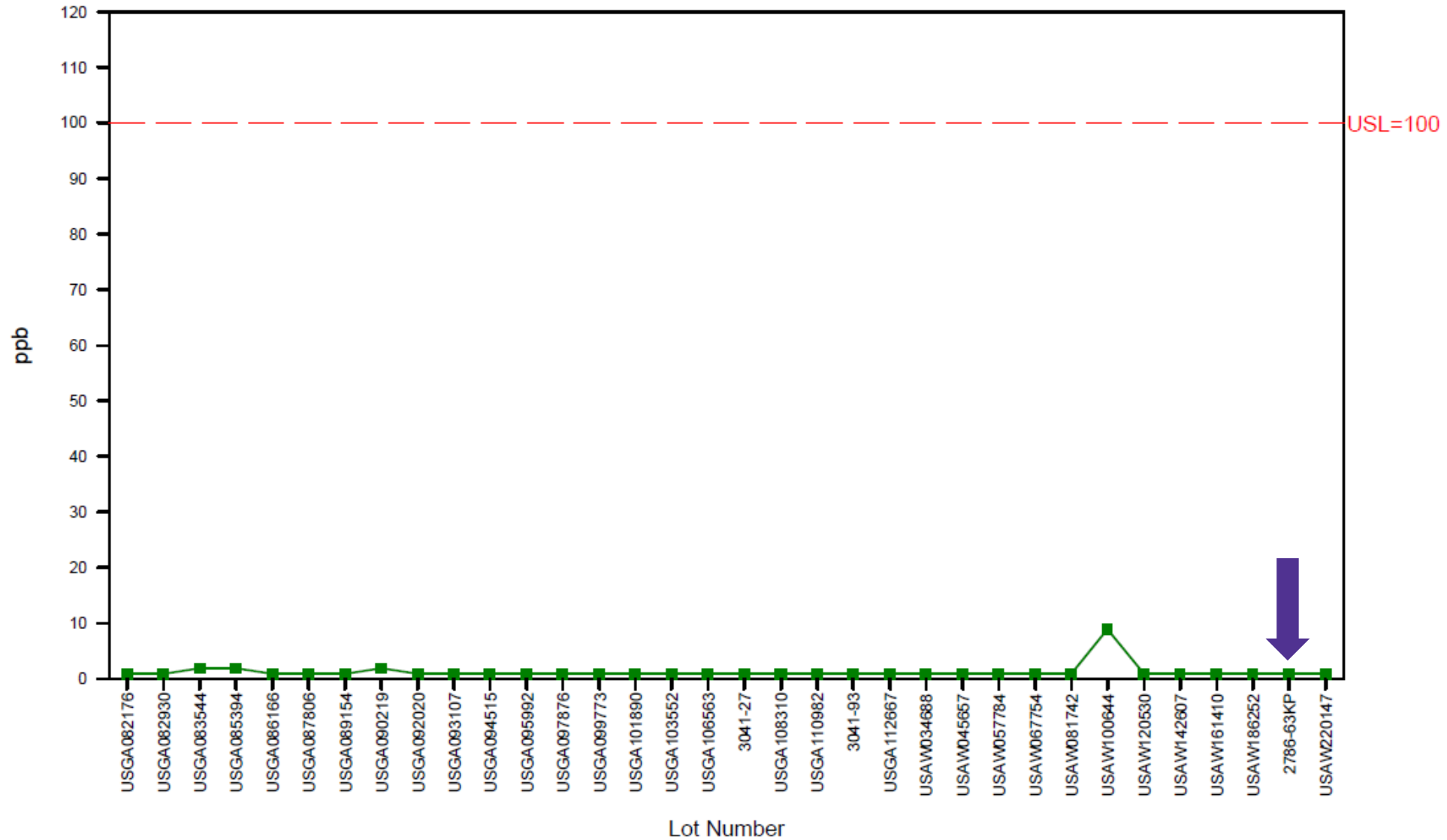
SPC Chart – PS: I-line E nominal vs. Reference



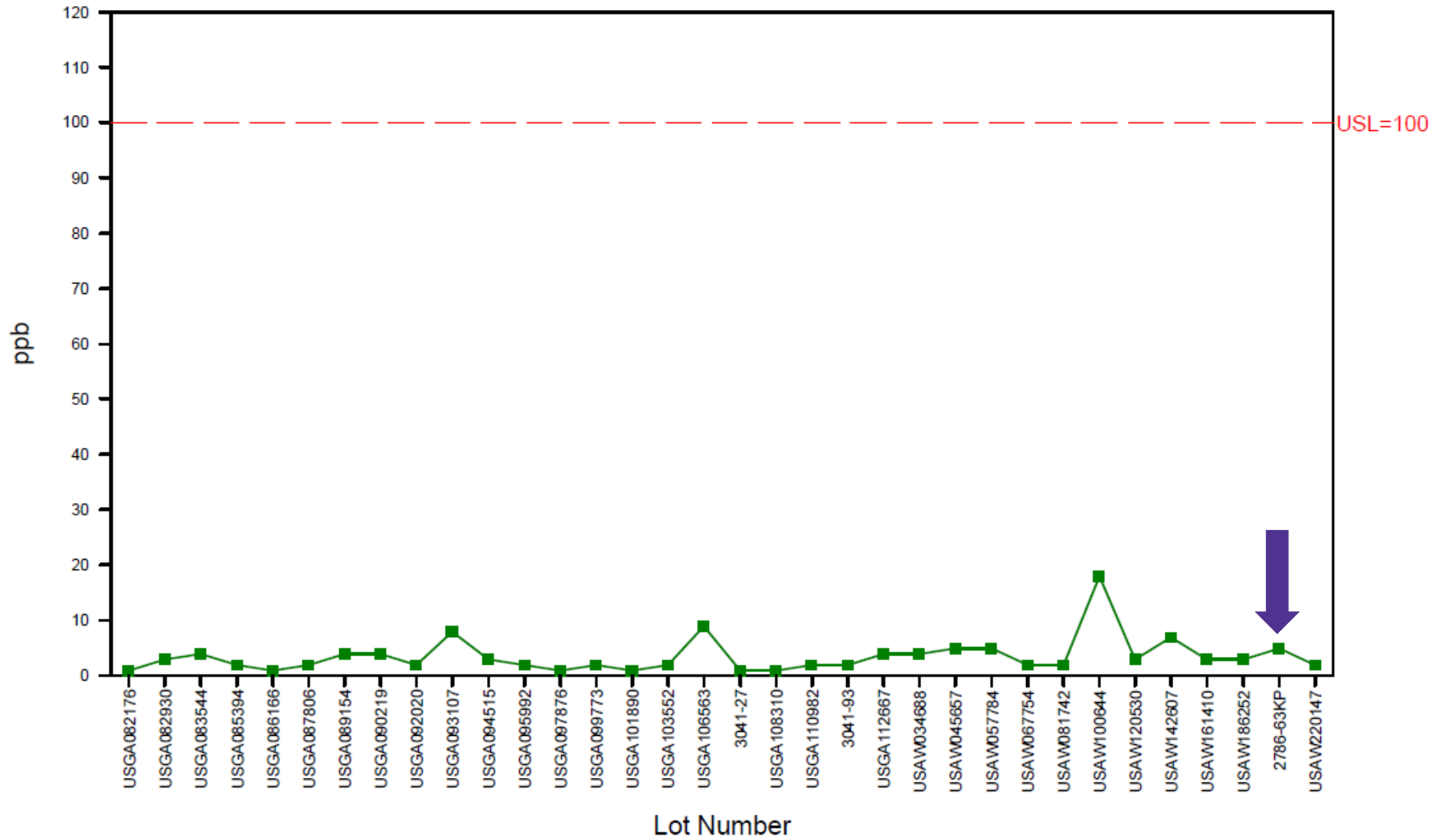
SPC Chart – Iron



SPC Chart – Potassium



SPC Chart – Sodium



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