

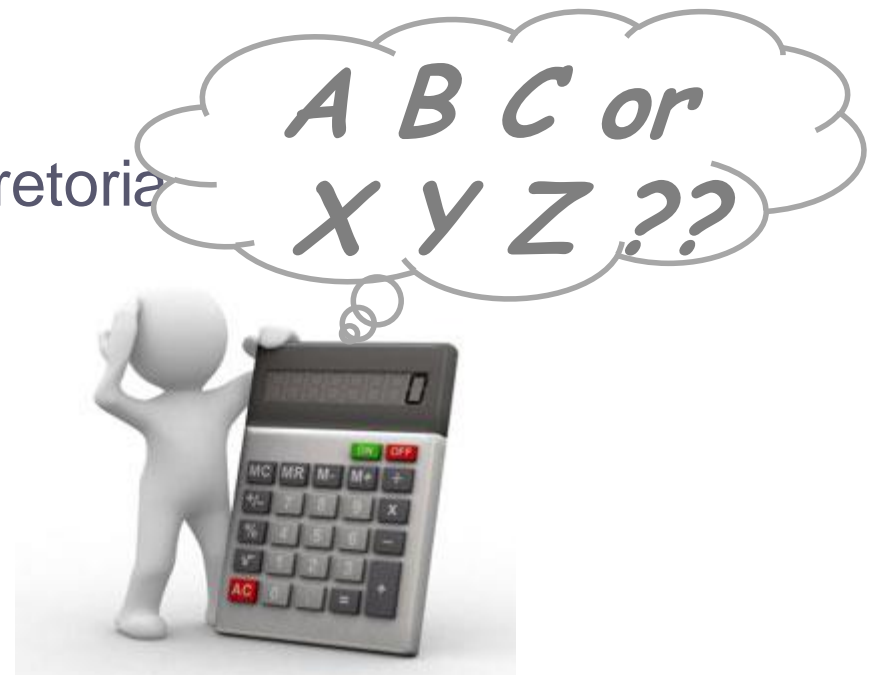
NLA PTS FEEDBACK BT

31st RPF

4th – 5th May 2016

CSIR Conference Centre, Pretoria

Barry Pearce



Discussion to include...

- Update
- BT analysis & feedback 2016
- Remaining 2016 program



Update & latest developments

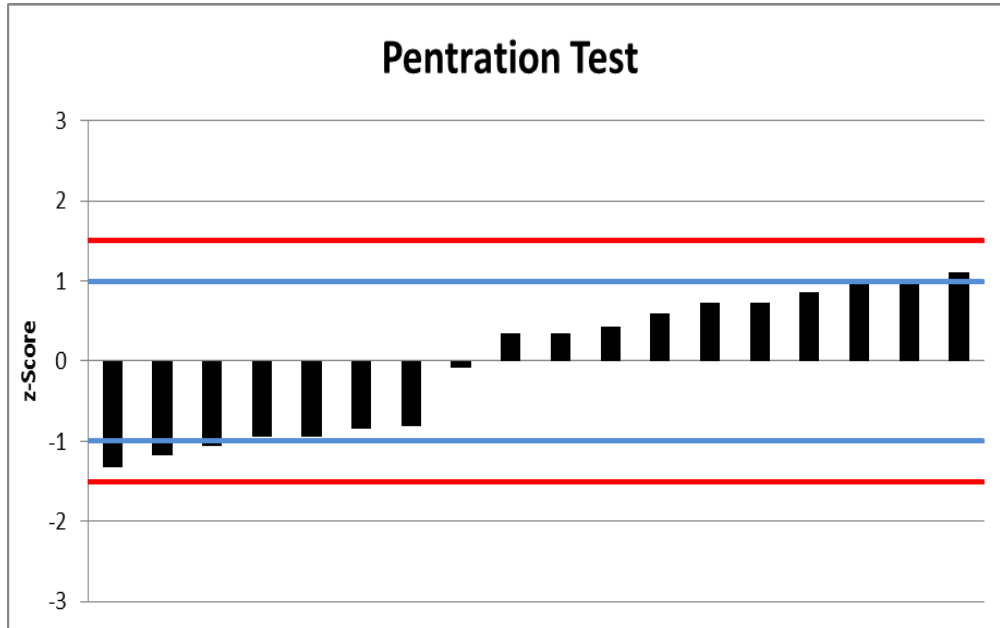
- NLA now accredited as PTS provider
 - Civils Document layout revised
 - If results not submitted as requested in protocols, results analysed as is
- Analysis of results
 - Robust analysis weights results
- MatCivils PTS looking to join from 2018
- Annual PTS advertised into end of each year
 - Select basket of PTS to partake in
 - Register for annual PTS with your choices
 - Pay applicable PTS fee
 - Once off for all PTS's chosen
 - Sit back & await your 1st sample
- 1 PTS undertaken so far
 - BT – Open bitumen
 - DSR methods under review
 - 7 PTS programmed
- Process now fixed for the year.
 - Subscribe for all rounds you wish to partake in
 - Dates fixed till December
 - Register & await samples
 - Late submission = excluded
 - 7 rounds = approx. R15 000
- Concrete still in limbo with SARMA
- Must follow method meticulously otherwise you build in additional variability

BT ANALYSIS

BT PTS feedback : General comments

- Dataset consisted of 19 participants
 - 1 participant didn't submit any results.
 - Lower numbers than AG, AS & GR
- Pen & R&B
 - 18 participants
 - Numbers dropped to almost ½ viscosity & RTFOT.
 - The Spot test – only 3 results
- Pen & R&B results acceptable
 - Approx $\frac{3}{4}$ had z-score $< \pm 1$.
 - R&B had 2 results > 1.5
 - but still within specification range
- RTFOT results must ensure correct units are used
 - % retained, increase in R&B, ...
- Viscosity results
 - 60 °C better than at 135 °C.
 - Both sets of results range $>$ spec.
 - 60 °C data only 3 results between 1 & 1.5
 - 135 °C data 2 results > 2 .
 - 1 z-score results possibly reported with incorrect units
- Fewer participants do these 2 methods
 - equipment not on their premises.
- 15 tested @ 135 °C while only 11 tested @ 60 °C
 - Possibly using hand held @ 135 °C

EN 1426 – Pen test

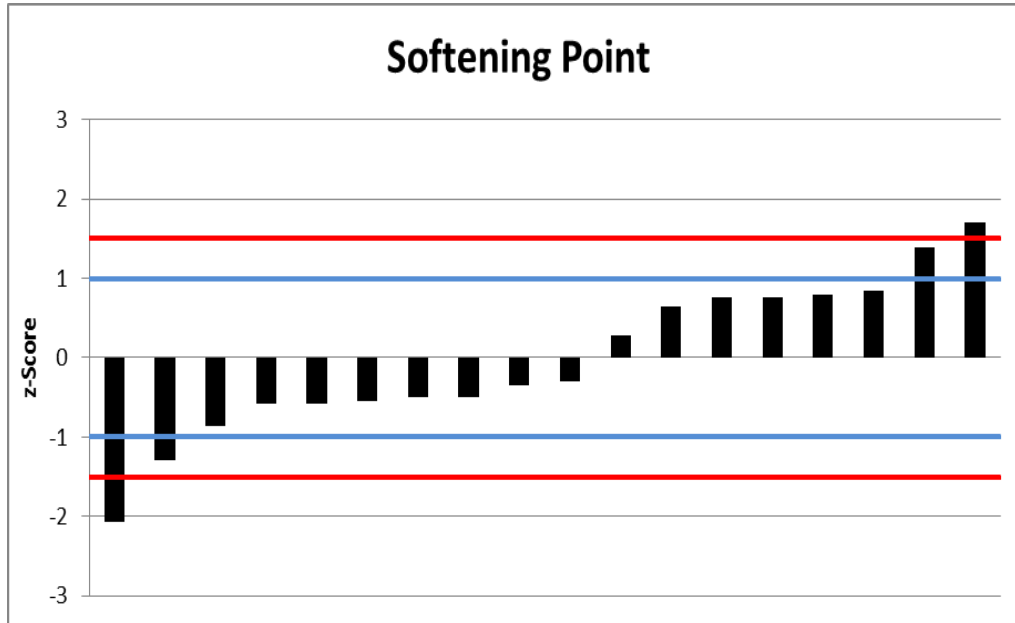


	Lab id	Avg dmm	z-score
1	ndc6z	59	-1.324
2	psm4m	60	-1.170
3	tgsk4	60	-1.067
4	d3dhr	61	-0.939
5	npxm4	61	-0.939
6	epmj9	61	-0.836
7	bhx3q	61	-0.811
8	tjd3d	64	-0.079
9	epdkm	66	0.344
10	hywqx	66	0.344
11	jgxsk	66	0.434
12	4smdt	67	0.601
13	zpd87	67	0.729
14	fsbt9	67	0.729
15	akz6k	68	0.858
16	j5pg5	68	0.986
17	xg3mr	68	1.024
18	dck4d	69	1.114
19	awmsy	NULL	N/A

- Range of 9.5 dmm within spec & z-scores <1.5
- Good set of results

AMC Robust Statistics V1.0	
Estimate	Avg dmm
Median	65.5
H15 mean	64.1583
H15 Std Dev	3.89659
Range	9.5

ASTM D 36 – R&B

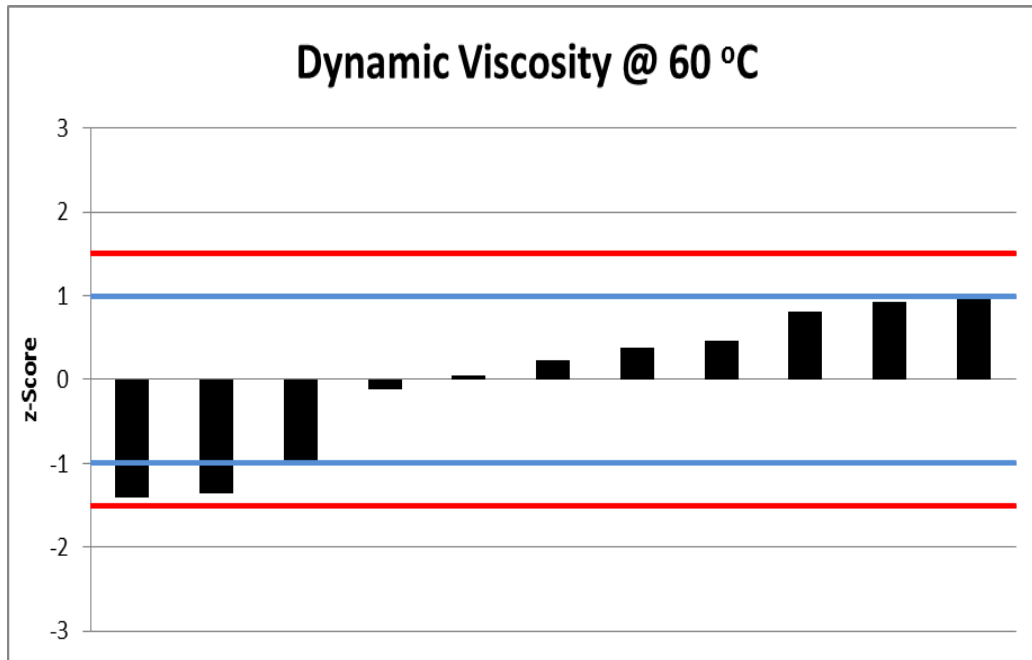


	Lab id	Avg °C	z-score
1	d3dhr	47	-2.072
2	epdkm	48	-1.286
3	psm4m	48	-0.853
4	zpd87	48	-0.578
5	ndc6z	48	-0.578
6	bhx3q	48	-0.538
7	npm4	49	-0.499
8	4smdt	49	-0.499
9	dck4d	49	-0.342
10	j5pg5	49	-0.302
11	xg3mr	50	0.288
12	epmj9	50	0.642
13	tgsk4	50	0.760
14	jgxsk	50	0.760
15	tjd3d	50	0.799
16	fsbt9	50	0.838
17	hywqx	51	1.389
18	akz6k	51	1.703
19	awmsy	NULL	N/A

- Range of 4.8 °C within spec
 - 1 z-scores >1.5 & 1 > 2
- Good set of results with exception 2 results

AMC Robust Statistics V1.0	
Estimate	Avg °C
Median	48.725
H15 mean	49.1344
H15 Std Dev	1.27137
Range	4.8

ASTM D 4402 – RV

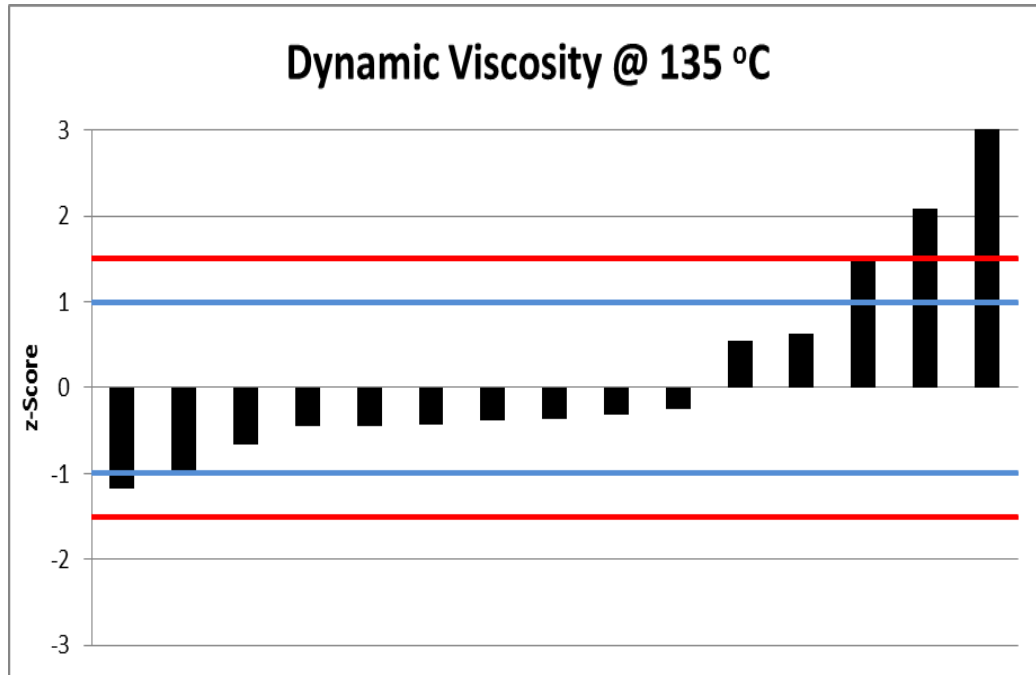


	Lab id	Avg Pa.s @ 60 °C	z-score
1	psm4m	85	-1.411
2	bhx3q	90	-1.358
3	npxm4	121	-0.988
4	d3dhr	193	-0.122
5	hywqx	207	0.055
6	dck4d	222	0.226
7	xg3mr	235	0.382
8	fsbt9	241	0.464
9	akz6k	271	0.816
10	epmj9	280	0.929
11	ndc6z	287	1.007
12	tgsk4	NULL	N/A
13	epdkm	NULL	N/A
14	zpd87	NULL	N/A
15	4smdt	NULL	N/A
16	jgxsk	NULL	N/A
17	tjd3d	NULL	N/A
18	awmsy	NULL	N/A
19	j5pg5	NULL	N/A

- Range of 201.3 Pa.s falls outside spec
 - 55 % fell outside the spec
 - No z-scores > 1.5
- Good set of results as per z-score but it's a different picture looking at the spec

AMC Robust Statistics V1.0	
Estimate	Avg Pa.s @ 60 °C
Median	221.5
H15 mean	202.7
H15 Std Dev	83.2
Range	201.3

ASTM D 4401 - RV

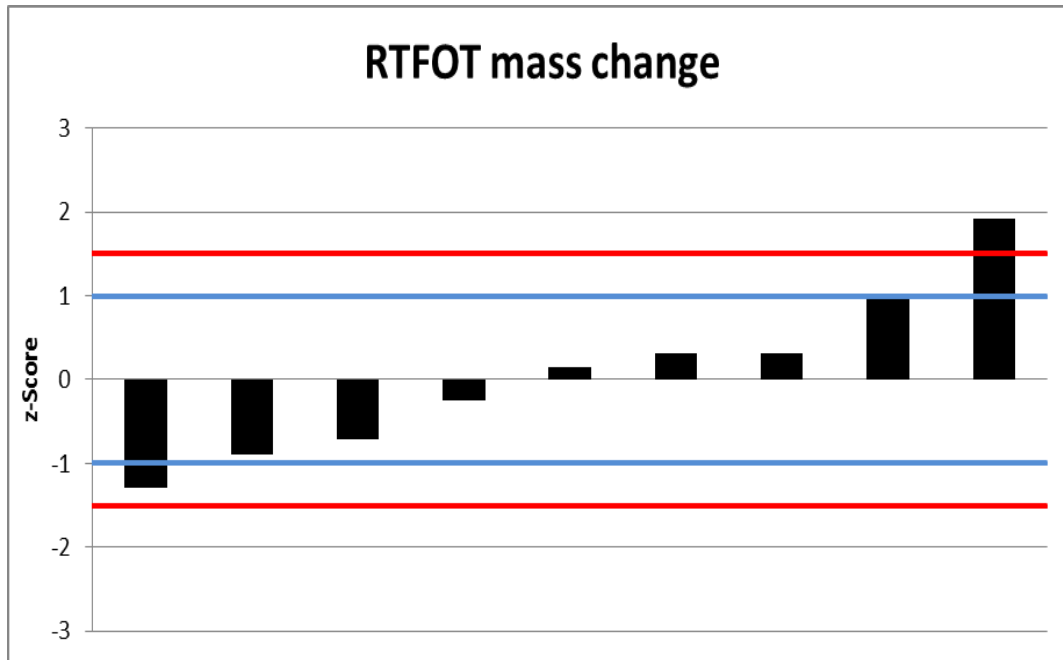


	Lab id	Avg Pa.s @ 135 °C	z-score
1	j5pg5	0.227	-1.180
2	npxm4	0.270	-1.030
3	d3dhr	0.375	-0.664
4	xg3mr	0.436	-0.453
5	hywqx	0.439	-0.442
6	akz6k	0.442	-0.432
7	dck4d	0.455	-0.385
8	epmj9	0.460	-0.367
9	ndc6z	0.475	-0.315
10	tjd3d	0.495	-0.245
11	psm4m	0.720	0.540
12	bhx3q	0.745	0.627
13	4smdt	0.995	1.499
14	zpd87	1.165	2.090
15	fsbt9	465.800	1622.7
16	jgxsk	NULL	N/A
17	awmsy	NULL	N/A
18	tgsk4	NULL	N/A
19	epdkm	NULL	N/A

- Range of 0.938 Pa.s falls outside spec
 - 60 % fell outside the spec
 - 2 z-score values > 2
- I result report incorrectly??
- Fair set of results as per z-score but again it's a different picture looking at the spec

AMC Robust Statistics V1.0	
Estimate	Avg Pa.s @ 135 °C
Median	0.46
H15 mean	0.5653
H15 Std Dev	0.2867
Range	0.938

ASTM D 2872 - RTFOT

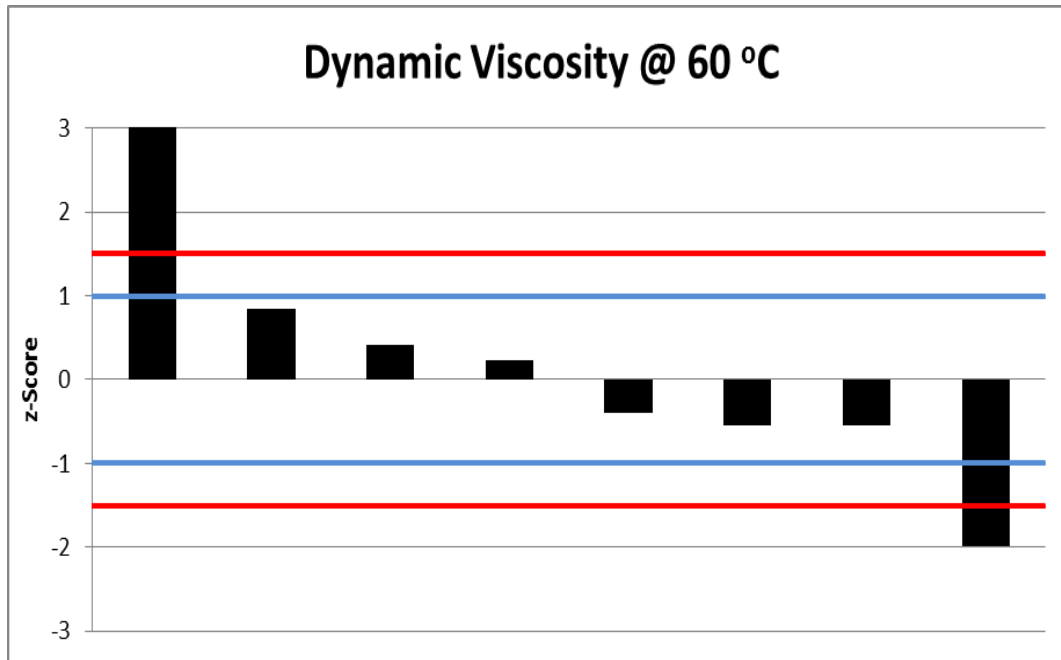


	Lab id	Avg Δ mass % m/m	z-score
1	ndc6z	0.000	-1.296
2	xg3mr	0.025	-0.894
3	tjd3d	0.036	-0.718
4	dck4d	0.065	-0.252
5	npxm4	0.090	0.149
6	epmj9	0.100	0.310
7	j5pg5	0.100	0.310
8	hywqx	0.142	0.976
9	akz6k	0.200	1.915
10	tgsk4	NULL	N/A
11	epdkm	NULL	N/A
12	xp2hp	NULL	N/A
13	fsbt9	NULL	N/A
14	d3dhr	NULL	N/A
15	bhx3q	NULL	N/A
16	4smdt	NULL	N/A
17	jpgxsk	NULL	N/A
18	psm4m	NULL	N/A
19	awmsy	NULL	N/A

- Range of 0.200 % m/m within spec
 - 1 z-score values > 1.5
- Fair set of results as per z-score & spec

AMC Robust Statistics V1.0	
Estimate	Avg Δ mass % m/m
Median	0.0900
H15 mean	0.0807
H15 Std Dev	0.0623
Range	0.200

ASTM D 2872 - RTFOT

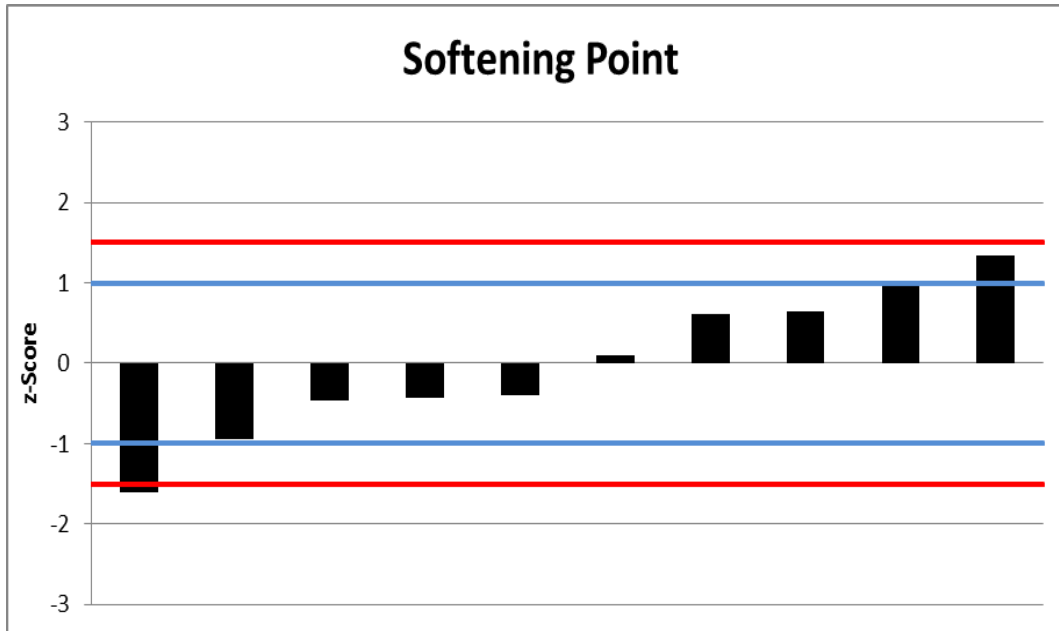


	Lab id	Avg Visc @ 60 °C	z-score
1	fsbt9	804.300	5.647
2	ndc6z	339.000	0.842
3	hywqx	298.000	0.419
4	npxm4	279.500	0.228
5	dck4d	218.500	-0.402
6	akz6k	205.000	-0.542
7	xg3mr	204.680	-0.545
8	epmj9	64.700	-1.990
9	tgsk4	NULL	N/A
10	epdkm	NULL	N/A
11	xp2hp	NULL	N/A
12	d3dhr	NULL	N/A
13	bhx3q	NULL	N/A
14	4smdt	NULL	N/A
15	jgxsk	NULL	N/A
16	psm4m	NULL	N/A
17	tjd3d	NULL	N/A
18	awmsy	NULL	N/A
19	j5pg5	NULL	N/A

- Range of 274.3 % m/m just within spec
 - 2 z-score values > 2 (*almost*)
- Fair set of results as per z-score & spec
 - Given difference in values of the 2 extreme results

AMC Robust Statistics V1.0	
Estimate	Avg Visc @ 60 °C
Median	249.0
H15 mean	257.4
H15 Std Dev	96.8
Range	274.3

ASTM D 2872 - RTFOT

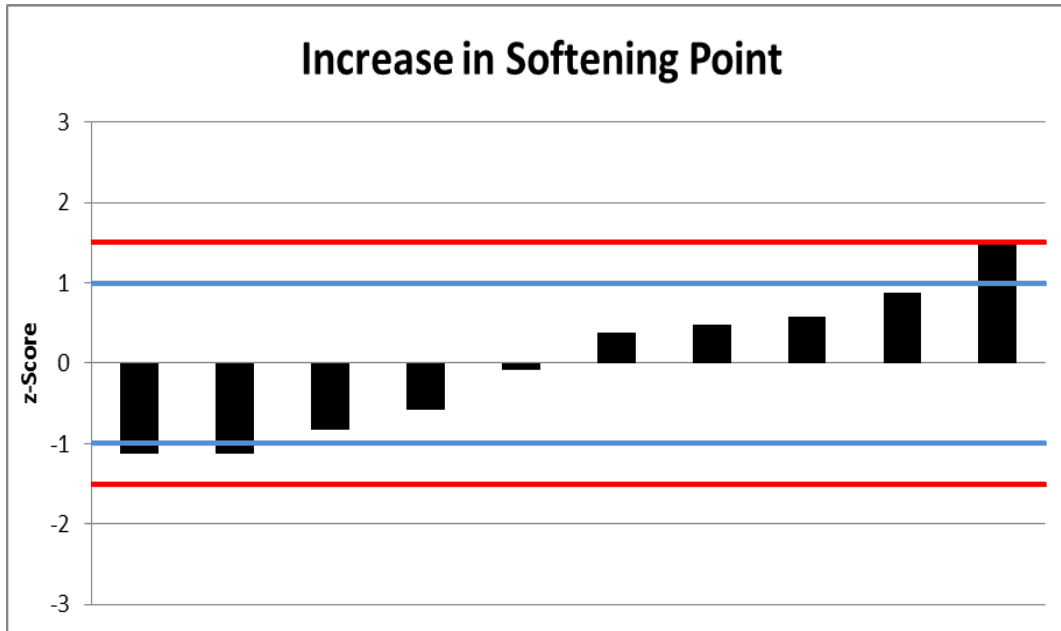


	Lab id	Avg R&B	z-score
1	hywqx	51.700	-1.607
2	akz6k	52.700	-0.937
3	tjd3d	53.400	-0.468
4	fsbt9	53.450	-0.434
5	ndc6z	53.500	-0.400
6	j5pg5	54.250	0.102
7	epmj9	55.000	0.605
8	dck4d	55.050	0.639
9	xg3mr	55.550	0.974
10	npxm4	56.100	1.342
11	tgsk4	NULL	N/A
12	epdkm	NULL	N/A
13	xp2hp	NULL	N/A
14	d3dhr	NULL	N/A
15	bhx3q	NULL	N/A
16	4smdt	NULL	N/A
17	jgxsk	NULL	N/A
18	psm4m	NULL	N/A
19	awmsy	NULL	N/A

- Range of 4.4 °C within spec
 - 1 z-score values > 1.5
- Fair set of results as per z-score & spec

AMC Robust Statistics V1.0	
Estimate	Avg R&B
Median	53.9
H15 mean	54.1
H15 Std Dev	1.5
Range	4.4

ASTM D 2872 - RTFOT

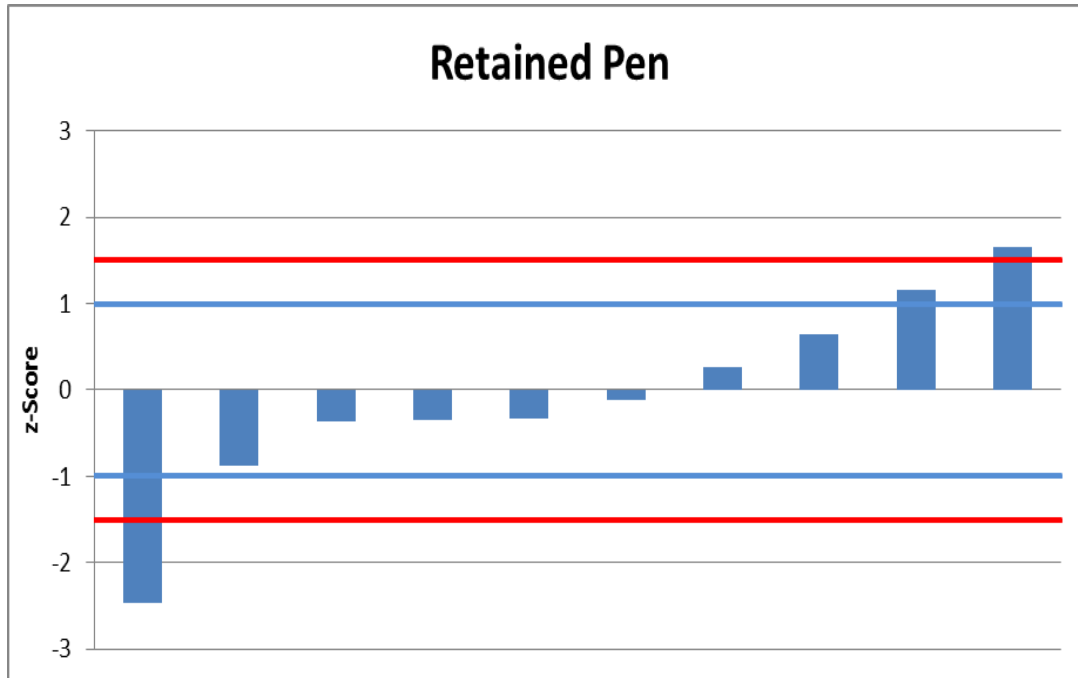


	Lab id	Avg > R&B	z-score
1	npxm4	3.200	-1.122
2	xg3mr	3.200	-1.122
3	epmj9	3.500	-0.823
4	j5pg5	3.750	-0.574
5	akz6k	4.250	-0.075
6	dck4d	4.700	0.373
7	fsbt9	4.800	0.473
8	tjd3d	4.900	0.573
9	hywqx	5.200	0.872
10	ndc6z	5.850	1.520
11	4smdt	NULL	N/A
12	awmsy	NULL	N/A
13	bhx3q	NULL	N/A
14	d3dhr	NULL	N/A
15	epdkm	NULL	N/A
16	jgxsk	NULL	N/A
17	psm4m	NULL	N/A
18	tgsk4	NULL	N/A
19	xp2hp	NULL	N/A

- Range of 2.7 °C within spec
 - 1 z-score values > 1.5
- Fair set of results as per z-score & spec

AMC Robust Statistics V1.0	
Estimate	Avg > R&B
Median	4.5
H15 mean	4.3
H15 Std Dev	1.0
Range	2.7

ASTM D 2872 - RTFOT

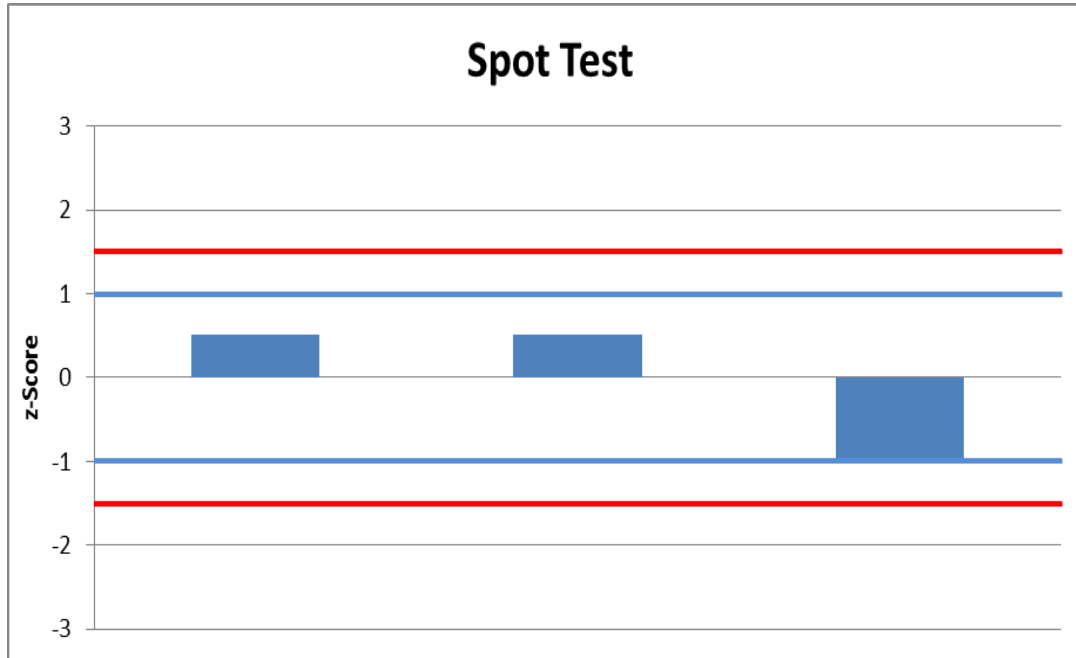


	Lab id	Avg retained Pen %	z-score
1	fsbt9	39.000	-2.465
2	tjd3d	60.850	-0.884
3	hywqx	67.950	-0.370
4	akz6k	68.150	-0.356
5	epmj9	68.400	-0.338
6	dck4d	71.500	-0.113
7	xg3mr	76.700	0.263
8	j5pg5	82.000	0.646
9	npxm4	89.000	1.153
10	ndc6z	96.000	1.659
11	<i>tgsk4</i>	NULL	N/A
12	<i>epdkm</i>	NULL	N/A
13	<i>xp2hp</i>	NULL	N/A
14	<i>d3dhr</i>	NULL	N/A
15	<i>bhx3q</i>	NULL	N/A
16	<i>4smdt</i>	NULL	N/A
17	<i>jgxsk</i>	NULL	N/A
18	<i>psm4m</i>	NULL	N/A
19	<i>awmsy</i>	NULL	N/A

- Range of 2.7 °C just outside spec
 - 1 z-score values > 1.5
 - 1 z-score values > 2
- Fair set of results as per z-score & spec
 - Given the 1 results that was way off the mark.

AMC Robust Statistics V1.0	
Estimate	Avg retained Pen %
Median	70.0
H15 mean	73.1
H15 Std Dev	13.8
Range	57.0

AASHTO T 102 – Spot test



	Lab id	Avg Spot test	z-score
1	ndc6z	30.000	0.509
2	j5pg5	30.000	0.509
3	hywqx	15.000	-1.019
4	tgsk4	NULL	N/A
5	epdkm	NULL	N/A
6	xp2hp	NULL	N/A
7	fsbt9	NULL	N/A
8	d3dhr	NULL	N/A
9	akz6k	NULL	N/A
10	epmj9	NULL	N/A
11	bhx3q	NULL	N/A
12	npxm4	NULL	N/A
13	4smdt	NULL	N/A
14	jpgsk	NULL	N/A
15	psm4m	NULL	N/A
16	tjd3d	NULL	N/A
17	xg3mr	NULL	N/A
18	awmsy	NULL	N/A
19	dck4d	NULL	N/A

- Range of 15 % within spec
- Too few results to make an accurate call on the results overall
 - Possibly always will be the case with this method

AMC Robust Statistics V1.0	
Estimate	Avg Spot test
Median	30
H15 mean	25
H15 Std Dev	9.8
Range	15

Comparison of Range results 2013 – 2016

Test	Units	2013	2016	
Pen	dmm	24.8	9.5	✓
R&B	°C	5.8	4.8	✓
Vis @ 60 °C	Pa.s	82	201	x
@ 135 °C	Pa.s	0.340	0.938	x
<u>RTFOT</u>				
Mass change	%	0.650	0.200	✓
R&B	°C	9.0	4.4	✓
> R&B	°C	7.5	2.7	✓
Retained Pen	%	32	57	x
Vis @ 60 °C	°C	165	274	x

- Pen, R&B & mass change improved
- Viscosity > for both 60 & 135 °C both before & after RTFOT
- Retained pen > after RTFOT

2016 Program

1 st Quarter		BT ✓	
2 nd Quarter		GR	AG
3 rd Quarter	AS	BT	GR
4 th Quarter	AG	AS	

- CO hopefully included in next years program
- Making good progress with full program as currently being advertised
 - this program assists in the structure required for inclusion onto accredited PTS with NLA

Future plans

- ASPASA & SARMA also looking to join PTS ...
 - Potential huge increase in agg, gravel & conc participants
 - Good for comparison values between suppliers & commercial labs
 - ?? How many took part in 1st AG
- Looking at options for results to be electronically submitted & partially analysed
 - If results entered incorrectly, analysed as given
 - To assist in quicker turnaround times for
 - Benefit of labs needing to take action
 - For accreditation purposes
- Reminder- Annual PTS advertised into end of each year
 - 1st one out for the remainder of this year
 - Select basket of PTS to partake in
 - Register for annual PTS with your choices
 - Pay applicable PTS fee
 - Once off for all PTS's chosen
 - Sit back & await your 1st sample

In closing... as always

Purpose

- to improve consistency of results between labs
- assist in identifying your own internal areas that require attention
- addressing these issues
- as a requirement for SANAS ISO 17025 accreditation

Building towards a more professional laboratory environment that will be seen as being

- Trustworthy
- Honest
- Quality driven

- Now we are really starting to get somewhere
- Keep at it!!

Thank folks...

