

14 March 2013

Northeast Asphalt User-Producer Group Second Interlaboratory Study to Determine the Precision of AASHTO TP70 – the Multiple- Stress Creep-Recovery (MSCR) Test

Prepared for the Northeast Asphalt User-Producer Group (NEAUPG)

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in cooperation with
the Federal Highway Administration

through
DTFH61-11-H-00033



Introduction

In 2010, the Northeast Asphalt User-Producer Group (NEAUPG) initiated an interlaboratory study (ILS) for participating labs to evaluate the repeatability and reproducibility of AASHTO TP70, *Multiple Stress Creep Recovery (MSCR) Test of Asphalt Binder Using a Dynamic Shear Rheometer (DSR)*. Twenty-eight (28) laboratories, principally located in the NEAUPG, agreed to participate in the study. Included were Users (12 labs), Producers (10 labs), and Industry/Academia (6 labs). These labs are shown in Table 1.

Table 1: Participating Labs in 2010 NEAUPG MSCR ILS

Users	Producers	Industry/Academia
Delaware DOT	All-States Asphalt	Asphalt Institute
Federal Highway Administration (FHWA) Office of Pavement Technology (2 labs)	Bitumar (2 labs)	Intertek-OCA
Maine DOT	Hudson	PRI Asphalt Technologies
Maryland SHA	Marathon	Rowan University
New Hampshire DOT	NuStar Asphalt	Rutgers University – CAIT Lab
New Jersey DOT	Peckham Industries	University of Connecticut - CAPLab
New York DOT	Pike Industries	
Pennsylvania DOT	RoadScience	
Rhode Island DOT	Suncor Energy	
Vermont AOT		
Virginia Transportation Research Council		

In the 2010 NEAUPG MSCR ILS, five asphalt binder samples were tested including PG 52-28, PG 64-22, PG 70-28, and PG 76-22 asphalt binders. All four asphalt binders were supplied to the participating labs as unaged material. The participating labs were then asked to conduct RTFO-aging and split the sample for further testing. In addition, the PG 76-22 asphalt binder was also supplied to the participating labs as an RTFO-aged binder. For this sample, Rutgers University conducted the RTFO-aging before shipping the samples to the labs.

Table 2 shows the calculated repeatability and reproducibility for the 2010 NEAUPG MSCR ILS compared to the ETG ILS.

Table 2: Comparison of 2010 NEAUPG ILS with ETG ILS

Condition	Acceptable Range of Two Test Results ($d_{2s}\%$) NEAUPG ILS	Acceptable Range of Two Test Results ($d_{2s}\%$) ETG ILS
<i>Single-Operator Precision:</i>		
Recovery _{0.1kPa} (%)	9.7%	6.7%
Recovery _{3.2kPa} (%)	7.7%	8.5%
<i>Multilaboratory Precision:</i>		
Recovery _{0.1kPa} (%)	14.0%	15.0%
Recovery _{3.2kPa} (%)	18.7%	18.1%
<i>Single-Operator Precision:</i>		
$J_{nr}@0.1kPa$ (kPa^{-1})		
>1.00	14.5%	12.8%
0.26 - 1.00	14.5%	15.2%
0.10 - 0.25	14.5%	38.3%
<0.10	n/a	n/a
$J_{nr}@3.2kPa$ (kPa^{-1})		
>1.00	14.5%	16.0%
0.26 - 1.00	14.5%	15.3%
0.10 - 0.25	n/a	26.6%
<0.10	n/a	n/a
<i>Multilaboratory Precision:</i>		
$J_{nr}@0.1kPa$ (kPa^{-1})		
>1.00	25.6%	25.6%
0.26 - 1.00	25.6%	35.6%
0.10 - 0.25	25.6%	46.8%
<0.10	n/a	n/a
$J_{nr}@3.2kPa$ (kPa^{-1})		
>1.00	33.7%	22.0%
0.26 - 1.00	33.7%	39.0%
0.10 - 0.25	n/a	42.6%
<0.10	n/a	n/a

Significant findings from the 2010 NEAUPG MSCR ILS were as follows:

- After removing potential outliers, the data indicated that in 10 of the 14 comparisons to the ETG ILS, the 2010 NEAUPG ILS had an equal or lower $d_{2s}\%$ value, thus indicating better repeatability and/or reproducibility than generated from the ETG ILS. In the four instances where the NEAUPG ILS had a higher value, the worst was the multilaboratory precision for J_{nr} -3.2 for materials having J_{nr} values greater than $1.00 kPa^{-1}$. In the 2010 NEAUPG ILS, that was the two unmodified asphalt binders – Binders 5 and 6.
- The analysis of the NEAUPG ILS data did not indicate that a tiered precision statement for J_{nr} was warranted. Values for $d_{2s}\%$ were approximately equal, regardless of the measured J_{nr} value.

- The additive variability caused by each lab performing RTFO aging before conducting MSCR tests was not seen in this study. The variability in MSCR results was actually less for the individually-aged samples (Binder 9) than the samples aged in a single lab (Sample 8).
- DSR equipment appeared to have some effect on test results. One particular brand of DSR exhibited significantly lower Rec-3.2 values for two of the asphalt binders than the other three brands. For one asphalt binder (Binder 5), the same DSR brand exhibited significantly higher values for Jnr-3.2 than the other three brands.

As a complement to the 2010 NEAUPG MSCR ILS, the NEAUPG MSCR Implementation Task Force decided to conduct a second ILS. Twenty-eight (28) laboratories agreed to participate in the 2012 NEAUPG MSCR ILS. Included were Users (13 labs/DSRs), Producers (9 labs), and Industry/Academia (6 labs). These labs are shown in Table 3.

Table 3: Participating Labs in 2012 NEAUPG MSCR ILS

Users	Producers	Industry/Academia
Delaware DOT (2 DSRs)	All-States Asphalt	Asphalt Institute
Federal Highway Administration (FHWA) Office of Pavement Technology (2 labs)	Bitumar	University of Massachusetts-Dartmouth (Highway Sustainability Research Center)
Maine DOT	Midland Asphalt	Intertek-OCA
Massachusetts DOT	Marathon	Rowan University
New Hampshire DOT (2 DSRs)	NuStar Asphalt (Paulsboro)	Rutgers University – CAIT Lab
New Jersey DOT	Peckham Industries	University of Connecticut - CAPLab
New York DOT	Pike Industries	
Pennsylvania DOT	NuStar Asphalt (Catoosa)	
Rhode Island DOT	Suit-Kote	
Vermont AOT		

Labs shown in **bold** also participated in the 2010 NEAUPG MSCR ILS

Each participating lab received one 8-oz tin (unaged) of five different asphalt binders (labeled as A, B, C, D, and E) representing both modified and unmodified asphalt binders. For each binder the labs were asked to do the following:

- Before conducting any testing, heat the 8-oz tin for each asphalt binder and pour a minimum of two RTFO bottles. Conduct the RTFO aging in accordance with AASHTO T240. After the RTFO aging is complete, scrape the bottles for each asphalt binder into a single container and stir. Split into separate 1-oz containers, if possible, and label each tin with the Sample Identification and replicate number (1-3 for Binders A, B, and E; 1-6 for Binders C and D).

- Perform the MSCR test (AASHTO TP70) on each asphalt binder sample as identified on the data form at the specified temperature. Perform the testing in the order indicated on the data form to minimize the possibility of bias in the data.
- Report all results and either e-mail or scan/fax the data form to the Asphalt Institute when complete. The deadline for the 2012 NEAUPG MSCR ILS was set as Friday February 1, 2013.

Five asphalt binders were supplied to the participating labs:

- Binder A was an unmodified PG 58-28. The MSCR test was to be performed in triplicate at 58°C.
- Binder B was an unmodified PG 64-22. The MSCR test was to be performed in triplicate at 64°C.
- Binder C was a modified PG 64-28. The MSCR test was to be performed in triplicate at 58°C (Samples 1-3) and 64°C (Samples 4-6).
- Binder D was a modified PG 70-28. The MSCR test was to be performed in triplicate at 58°C (Samples 1-3) and 64°C (Samples 4-6).
- Binder E was a modified PG 76-22. The MSCR test was to be performed in triplicate at 64°C.

Unlike the 2010 NEAUPG MSCR ILS, no specific heating or handling instructions were provided. Labs were simply asked to conduct RTFO-aging before splitting the samples into the appropriate containers.

ILS Procedure

The ILS procedure followed the guidelines in ASTM E691, *Standard Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method*. The purpose of an ILS is to develop information needed for a precision statement. However, the practice cautions the reader that:

“The precision statistics obtained by an ILS such as described in this practice must not be treated as exact mathematical quantities which are applicable to all circumstances and uses...The repeatability limit and reproducibility limit should be considered as general guides, and the associated probability of 95% as only a rough indicator of what can be expected.”

Results

Data was analyzed separately for each asphalt binder sample and test result – J_{nr} @ 0.1 kPa shear stress (Jnr-0.1), Recovery @ 0.1 kPa shear stress (Rec-0.1), J_{nr} @ 3.2 kPa shear stress (Jnr-3.2), Recovery @ 3.2 kPa shear stress (Rec-3.2), and the difference between the J_{nr} values at the two stress levels expressed as a percentage (Jnr-Diff). An example of the data is shown in Table 4. The Appendix contains all thirty-five data tables.

Table 4: Binder B (PG 64-22) Data for Jnr-3.2

Binder B								
PG 64-22								
Jnr (3.2 kPa)								
Lab No.		Results, x						
Lab No.	Lab Name	1	2	3	Average	s	d	h
1		2.656	2.652	2.656	2.65440	0.00252	0.06148	0.27
2		2.480	2.480	2.410	2.45667	0.04041	-0.13625	-0.60
3		2.648	2.677	2.697	2.67400	0.02464	0.08108	0.36
4		2.030	2.049	2.100	2.05967	0.03620	-0.53325	-2.35
5		2.289	2.291	2.2900	0.00141	-0.30292	-1.33	0.02
6		2.730	2.651	2.769	2.71667	0.06012	0.12375	0.54
7		2.587	2.816	2.739	2.71400	0.11653	0.12108	0.53
8		2.390	2.369	2.323	2.36067	0.03427	-0.23225	-1.02
9		2.399	2.390	2.39450	0.00636	-0.19842	-0.87	0.07
10		2.435	2.518	2.598	2.51700	0.08150	-0.07592	-0.33
11		2.613	2.648	2.697	2.65267	0.04219	0.05975	0.26
12		2.676	2.558	2.584	2.60600	0.06200	0.01308	0.06
13		2.533	2.545	2.622	2.56667	0.04829	-0.02625	-0.12
14		2.829	2.680	2.799	2.76933	0.07881	0.17641	0.78
15		2.950	2.345	2.446	2.58033	0.32410	-0.01259	-0.06
16		2.882	3.032	2.893	2.93567	0.08361	0.34275	1.51
17		2.800	2.900	2.900	2.86667	0.05774	0.27375	1.21
18		1.814	2.099	2.094	2.00233	0.16312	-0.59059	-2.60
19		2.584	2.517	2.548	2.54967	0.03353	-0.04325	-0.19
20		2.625	2.655	2.598	2.62600	0.02851	0.03308	0.15
21		3.005	2.995	3.035	3.01167	0.02082	0.41875	1.84
22		2.749	2.722	2.725	2.73200	0.01480	0.13908	0.61
23		2.703	2.648	2.633	2.66133	0.03686	0.06841	0.30
24		2.692	2.558	2.606	2.61867	0.06789	0.02575	0.11
25		2.699	2.797	2.725	2.74033	0.05077	0.14741	0.65
26		2.707	2.759	2.740	2.73533	0.02631	0.14241	0.63
27		2.671	2.585	2.795	2.68367	0.10557	0.09075	0.40
28		2.483	2.520	2.275	2.42589	0.13215	-0.16703	-0.74
Average of Cell Averages		X-bar	2.593					
Standard Deviation of Cell Averages		S _{x-bar}	0.227					
Repeatability Standard Deviation		S _r	0.08968	0.239				
Reproducibility Standard Deviation		S _R	0.239					

A quality review of the data resulted in the removal of some data points from the participating labs. Data was only removed for this initial analysis where there was a clear error in the reported values.

The values for Repeatability Standard Deviation (s_r) and Reproducibility Standard Deviation (s_R) are used to determine the $1s$, $1s\%$, $d2s$, and $d2s\%$ values for repeatability (within-lab) and reproducibility (between-lab), respectively.

The data can also be represented graphically as shown in Figure 1 and Figure 2 (with bands shown for data within one, two, and three standard deviations).

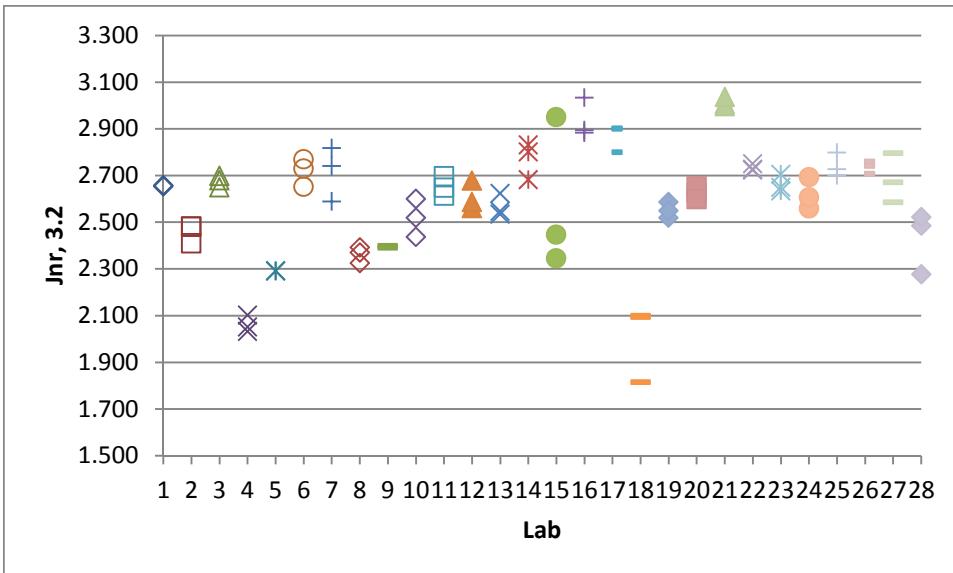


Figure 1: Binder B (PG 64-22) Data for Jnr-3.2

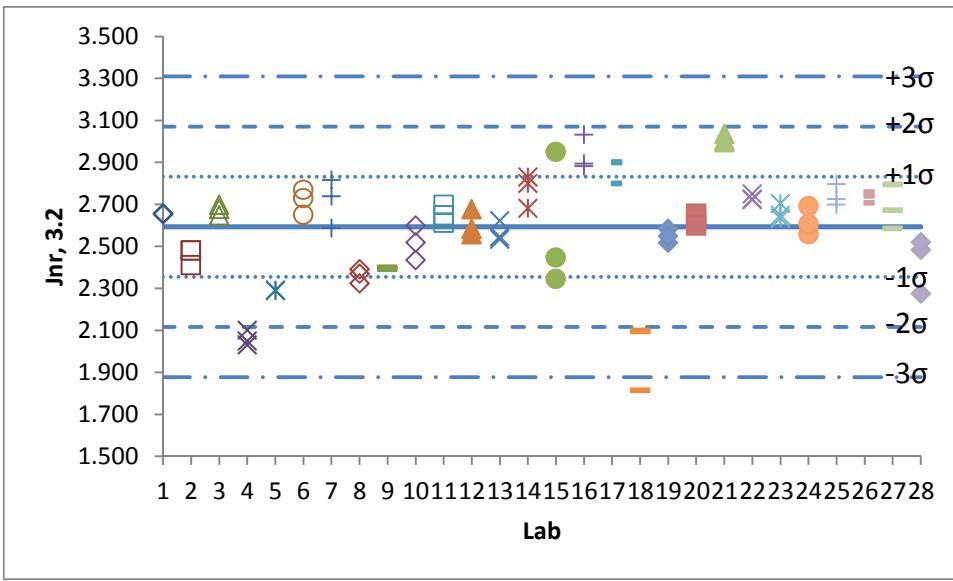


Figure 2: Binder B (PG 64-22) Data for Jnr-3.2 with Standard Deviation Bands Shown

After initial removal of the clearly poor quality data, the procedure recommends that outliers should be identified through a consistency analysis. The consistency analysis in ASTM E691 considers two consistency statistics. The “h” consistency statistic is “...an indicator of how one laboratory’s cell average, for a particular material, compares with the average of the other laboratories.” The “k” consistency statistic is “...an indicator of how one laboratory’s within-laboratory variability, under repeatability conditions, on a particular material, compares with all of the laboratories combined. Values of ‘k’ larger than 1 indicate greater within-laboratory variability than the average for all laboratories.” Critical values are chosen at a significance level of 0.5%.

Tables of the “h” and “k” consistency statistics were created for each of the five test parameters: Jnr-0.1, Jnr-3.2, Rec-0.1, Rec-3.2, and Jnr-Diff. These tables are provided in the Appendix with an example table provided below.

Table 5: Consistency Statistic “h” for Jnr-3.2

		h							
		Critical Value = 2.63							
		2.63	2.63	2.63	2.63	2.63	2.63	2.63	
Jnr (3.2 kPa)									
Lab No.	Lab Name	Material	Binder A	Binder B	Binder C	Binder C64	Binder D	Binder D64	Binder E
1			0.27	0.27	0.04	-0.27	0.46	0.40	0.24
2			0.11	-0.60	-0.36	-0.01	-0.35	-0.52	-0.41
3			0.46	0.36	-0.28	-0.84	0.20	-0.09	-0.21
4			-2.18	-2.35		-1.72	-1.87	-1.12	-1.19
5			-1.20	-1.33	-1.00		1.23		2.68
6			0.34	0.54	1.00		0.41		0.60
7			0.46	0.53	0.22		-0.23		1.10
8			-0.58	-1.02	0.12		-1.12		-0.41
9			-0.96	-0.87	-1.09	-1.07	-0.71	-0.97	-0.26
10			-0.76	-0.33	-0.72	-0.09	0.10	-0.39	0.13
11			-0.20	0.26	-0.84	-0.32	-1.08	-0.62	-0.87
12			-0.23	0.06	-0.22	-0.25	-0.06	0.06	0.12
13			-0.63	-0.12	-1.14	-1.12	-0.69	-0.68	-0.17
14			-0.04	0.78	0.17	0.14	0.06	0.11	0.60
15			-0.22	-0.06	0.72	0.06	0.49	-0.04	0.48
16			1.81	1.51	0.97	1.09	0.65	0.11	0.83
17			1.65	1.21	0.34		-1.26		-1.58
18			-2.30	-2.60	-1.89	-1.46	-1.89	-1.62	-1.94
19			-0.50	-0.19	-0.86	-0.88	0.29	0.07	-0.01
20			0.64	0.15	1.87	0.32	0.81	0.48	1.04
21			1.41	1.84	0.69	1.54	3.10	3.46	1.33
22			1.05	0.61	0.32	0.59	-0.01	0.07	0.51
23			0.32	0.30	1.76	2.66	1.14	1.58	0.07
24			0.04	0.11	-0.38	0.17	-0.43	-0.28	-0.83
25			1.21	0.65	2.18	0.74	1.30	0.78	0.63
26			0.20	0.63	0.10	0.34	-0.90	-0.30	-0.65
27			0.66	0.40	-0.13	0.66	-0.35	-0.24	-0.90
28			-0.87	-0.74	0.09	-0.12	-0.05	-0.18	-0.12

exceeds h

exceeds h-0.5

In Table 5, purple-shaded cells indicate values that exceed the critical value of “h”, indicating inconsistent or questionable data. Yellow-shaded cells are warning indicators that the value is approaching the critical value of “h”.

The data in the consistency tables can be used with graphs to identify if inconsistent data should be eliminated when determining the precision estimates. For example, Lab 21 has “h” values exceeding the critical value for Binder D and D64 (Binder D tested at 64°C). This can also be seen graphically in Figure 4, where the Lab 21 data is circled.

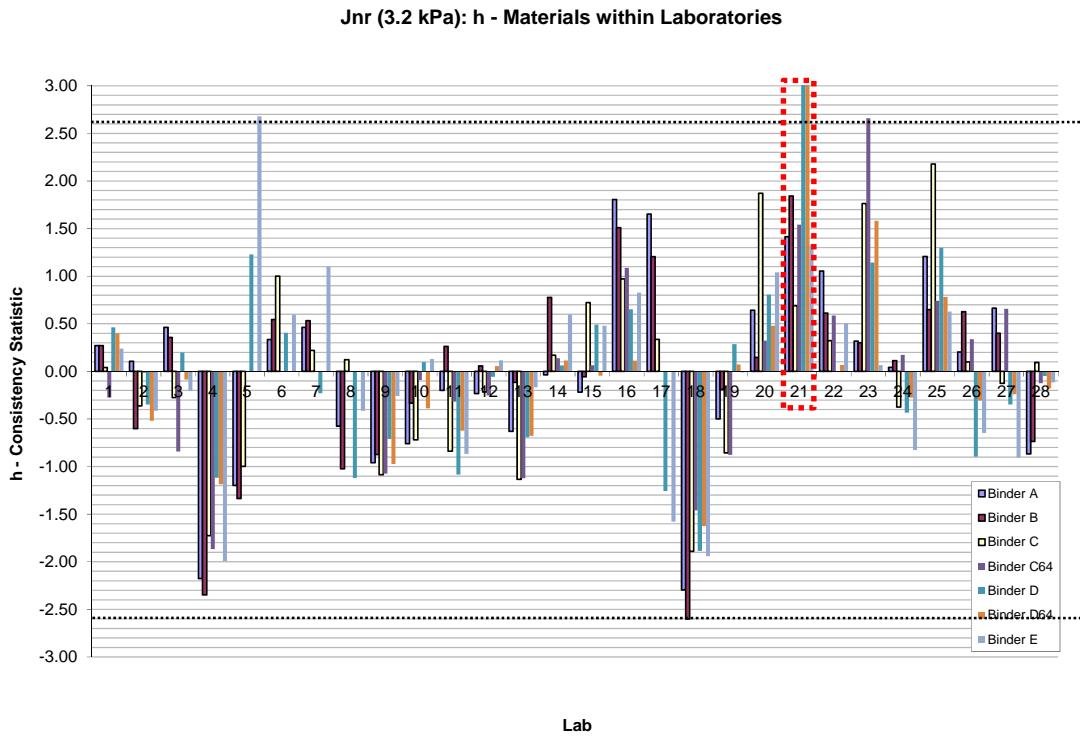


Figure 3: Consistency Statistic “h” for Jnr-3.2 – All Labs and Materials

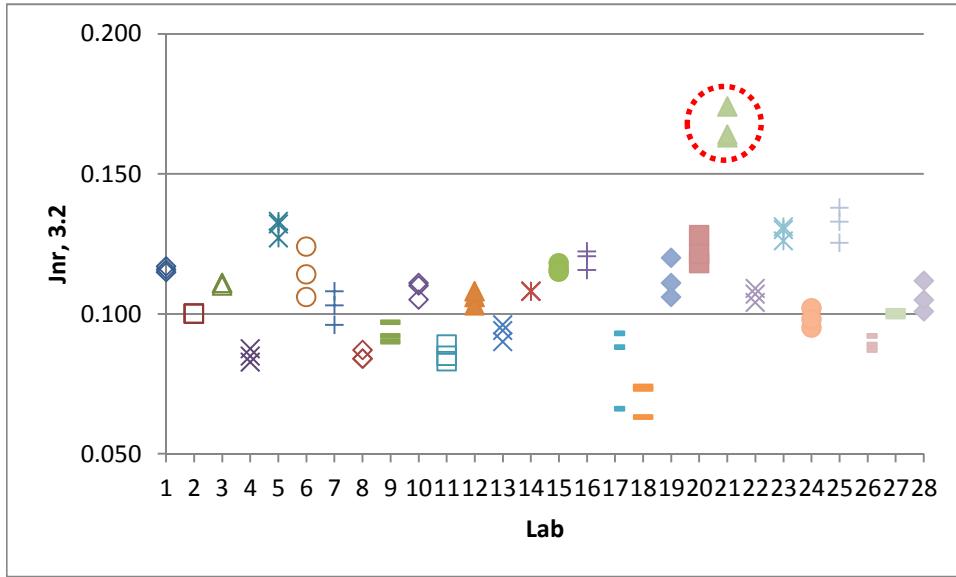


Figure 4: Binder D Data for Jnr-3.2

Based on the consistency analysis, the Jnr-3.2 data from Lab 21 for Binder D was eliminated from the repeatability and reproducibility calculation.

This same analysis was conducted for each of the “flagged” data in the consistency tables. It should be noted that ASTM E691 generally does not advocate excluding data except in special

instances and recommends against excluding more than 5% of the ILS data to prevent presenting precision that cannot be met in routine use. Thus, to meet this requirement, no more than 1 cell should be eliminated per binder for each MSCR parameter. In a couple of instances data from two Labs was eliminated.

Based on the consistency analysis, the data in Table 6 was excluded from the calculation of repeatability and reproducibility.

Table 6: Data Excluded from Repeatability and Reproducibility Calculations

	Jnr-0.1	Jnr-3.2	Rec-0.1	Rec-3.2	Jnr-Diff
Binder A	none	none	none	none	none
Binder B	none	none	none	none	Lab 15
Binder C (58°C)	Lab 6	none	none	Lab 15	Lab 5
Binder C (64°C)	none	Lab 23	none	none	Lab 15
Binder D (58°C)	none	Lab 21	Lab 5 Lab 21	Lab 5 Lab 21	none
Binder D (64°C)	Lab 21	Lab 21	Lab 21	Lab 21	Lab 15
Binder E	none	none	Lab 5	Lab 5	none

After excluding the data indicated in Table 6, the repeatability and reproducibility was calculated. This data is shown in Tables 7-11.

Table 7: Repeatability and Reproducibility Calculations for Jnr-0.1

ID	Binder	X-bar	S _{X-bar}	S _r	S _R	r	R	Repeatability		Reproducibility	
								1s%	d2s%	1s%	d2s%
A	PG 58-28	2.70129	0.23103	0.07352	0.23870	0.20586	0.66837	2.7%	7.6%	8.8%	24.7%
B	PG 64-22	2.35547	0.20889	0.08945	0.22129	0.25045	0.61962	3.8%	10.6%	9.4%	26.3%
C	PG 64-28	1.00487	0.12066	0.05185	0.12787	0.14517	0.35805	5.2%	14.4%	12.7%	35.6%
C64	PG 64-28	2.39561	0.25444	0.12250	0.27339	0.34300	0.76550	5.1%	14.3%	11.4%	32.0%
D	PG 70-28	0.10115	0.01832	0.00631	0.01903	0.01766	0.05328	6.2%	17.5%	18.8%	52.7%
D64	PG 70-28	0.22774	0.02783	0.00873	0.02873	0.02445	0.08044	3.8%	10.7%	12.6%	35.3%
E	PG 76-22	0.18530	0.02650	0.01010	0.02776	0.02828	0.07772	5.5%	15.3%	15.0%	41.9%

Table 8: Repeatability and Reproducibility Calculations for Jnr-3.2

ID	Binder	X-bar	S _{X-bar}	S _r	S _R	r	R	Repeatability		Reproducibility	
								1s%	d2s%	1s%	d2s%
A	PG 58-28	2.98425	0.24593	0.07151	0.25277	0.20023	0.70776	2.4%	6.7%	8.5%	23.7%
B	PG 64-22	2.59292	0.22707	0.08968	0.23858	0.25110	0.66804	3.5%	9.7%	9.2%	25.8%
C	PG 64-28	1.34383	0.16748	0.05887	0.17424	0.16483	0.48788	4.4%	12.3%	13.0%	36.3%
C64	PG 64-28	3.27558	0.27039	0.17965	0.30761	0.50303	0.86132	5.5%	15.4%	9.4%	26.3%
D	PG 70-28	0.10454	0.01576	0.00481	0.01624	0.01347	0.04548	4.6%	12.9%	15.5%	43.5%
D64	PG 70-28	0.27367	0.03796	0.01341	0.03951	0.03756	0.11062	4.9%	13.7%	14.4%	40.4%
E	PG 76-22	0.20152	0.02439	0.00781	0.02521	0.02187	0.07059	3.9%	10.9%	12.5%	35.0%

Table 9: Repeatability and Reproducibility Calculations for Rec-0.1

ID	Binder	X-bar	$s_{X\bar{}}^{} \bar{}$	s_r	s_R	r	R	Repeatability		Reproducibility	
								1s%	d2s%	1s%	d2s%
A	PG 58-28	3.46081	1.26969	1.03259	1.52412	2.89126	4.26754	29.8%	83.5%	44.0%	123.3%
B	PG 64-22	3.56747	1.36551	0.72336	1.48777	2.02542	4.16575	20.3%	56.8%	41.7%	116.8%
C	PG 64-28	24.19462	2.40892	0.90147	2.51886	2.52412	7.05281	3.7%	10.4%	10.4%	29.2%
C64	PG 64-28	17.10437	1.83866	0.90671	1.98210	2.53878	5.54989	5.3%	14.8%	11.6%	32.4%
D	PG 70-28	75.09471	1.71304	0.54028	1.76893	1.51280	4.95299	0.7%	2.0%	2.4%	6.6%
D64	PG 70-28	69.61601	1.57863	0.41115	1.61393	1.15122	4.51899	0.6%	1.7%	2.3%	6.5%
E	PG 76-22	76.93866	1.40618	0.63457	1.49860	1.77681	4.19607	0.8%	2.3%	1.9%	5.5%

Table 10: Repeatability and Reproducibility Calculations for Rec-3.2

ID	Binder	X-bar	$s_{X\bar{}}^{} \bar{}$	s_r	s_R	r	R	Repeatability		Reproducibility	
								1s%	d2s%	1s%	d2s%
A	PG 58-28	0.71720	0.48676	0.14224	0.50042	0.39827	1.40117	19.8%	55.5%	69.8%	195.4%
B	PG 64-22	1.00146	0.60288	0.30558	0.65247	0.85562	1.82690	30.5%	85.4%	65.2%	182.4%
C	PG 64-28	6.98704	1.70065	0.47322	1.74399	1.32501	4.88317	6.8%	19.0%	25.0%	69.9%
C64	PG 64-28	2.17981	0.85302	0.16252	0.86328	0.45505	2.41718	7.5%	20.9%	39.6%	110.9%
D	PG 70-28	73.80076	1.76148	0.46081	1.80122	1.29027	5.04341	0.6%	1.7%	2.4%	6.8%
D64	PG 70-28	63.64337	2.40014	0.66202	2.46025	1.85365	6.88871	1.0%	2.9%	3.9%	10.8%
E	PG 76-22	75.53533	1.28502	0.58973	1.37227	1.65125	3.84235	0.8%	2.2%	1.8%	5.1%

Table 11: Repeatability and Reproducibility Calculations for Jnr-Diff

ID	Binder	X-bar	$s_{X\bar{}}^{} \bar{}$	s_r	s_R	r	R	Repeatability		Reproducibility	
								1s%	d2s%	1s%	d2s%
A	PG 58-28	10.49013	1.59586	1.46571	1.99474	4.10399	5.58526	14.0%	39.1%	19.0%	53.2%
B	PG 64-22	9.63297	0.71368	1.32450	1.32450	3.70860	3.70860	13.7%	38.5%	13.7%	38.5%
C	PG 64-28	32.98853	2.65502	2.05889	3.14247	5.76489	8.79893	6.2%	17.5%	9.5%	26.7%
C64	PG 64-28	37.89423	1.90763	1.75524	2.38600	4.91468	6.68079	4.6%	13.0%	6.3%	17.6%
D	PG 70-28	5.01081	4.12138	2.43332	4.57528	6.81331	12.81078	48.6%	136.0%	91.3%	255.7%
D64	PG 70-28	19.69750	4.58745	1.81158	4.82002	5.07242	13.49604	9.2%	25.8%	24.5%	68.5%
E	PG 76-22	8.66763	5.19999	1.88139	5.42214	5.26790	15.18200	21.7%	60.8%	62.6%	175.2%

In the tables above:

- “X-bar” represents the average value from the participating labs for each binder sample
- “ s_r ” represents the within-lab (single operator) standard deviation, or 1s. Dividing this value by the average value generates the Repeatability coefficient of variation, or 1s%. Multiplying s_r by 2.8 generates the acceptable range of two test results under repeatability conditions, or d2s. Dividing this product by the average value results in the d2s%.
- “ s_R ” represents the between-lab standard deviation, or 1s. Dividing this value by the average value generates the Reproducibility coefficient of variation, or 1s%. Multiplying s_R by 2.8 generates the acceptable range of two test results under reproducibility conditions, or d2s. Dividing this product by the average value results in the d2s%.

The original MSCR ILS conducted through the Asphalt Binder Expert Task Group (ETG) resulted in the development of a tiered precision statement for J_{nr} and a regular precision statement for Recovery. The “tiers” for J_{nr} were established as follows:

- J_{nr} greater than 1.00 kPa^{-1} ;
- J_{nr} greater than 0.25 kPa^{-1} and less than or equal to 1.00 kPa^{-1} ; and

- J_{nr} greater than 0.10 kPa^{-1} and less than or equal to 0.25 kPa^{-1}

The data from the 2010 NEAUPG MSCR ILS did not support the tiered precision statement developed by the Asphalt Binder ETG. Repeatability and Reproducibility values appeared very similar for J_{nr} for all asphalt binders. As such, average values were calculated for J_{nr} repeatability and reproducibility.

The data in Tables 7 and 8 generally indicates lower Reproducibility $d2s\%$ values for the greater values of J_{nr} , but the trend is not as significant as was observed in the ETG ILS data set. This is shown in Figure 5. The Reproducibility $d2s\%$ values are shown by the filled and open squares. The Repeatability $d2s\%$ values are shown by the filled and open diamonds.

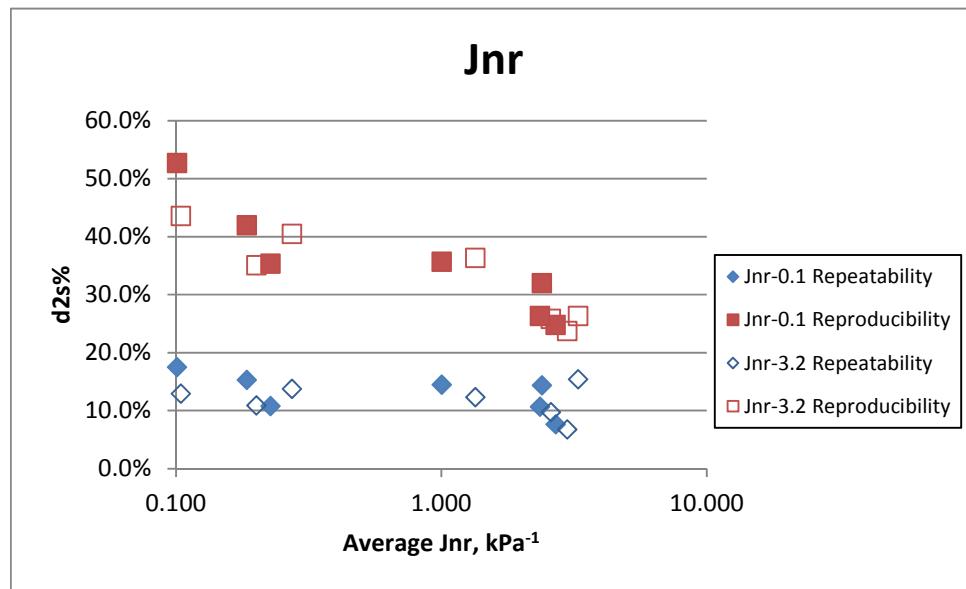


Figure 5: $d2s\%$ as a Function of J_{nr} Value

The data in Tables 9 and 10 were used to calculate average values for Recovery repeatability and reproducibility. Figures 6 and 7 show the $d2s$ and $d2s\%$ values as a function of Recovery value. As shown in Figure 6, the $d2s$ shows no apparent trend as a function of Recovery value. However, in Figure 7, there does appear to be a relationship between $d2s\%$ and Recovery value – with higher $d2s\%$ associated with lower values of Recovery. For constant $d2s$ values, a decrease in average value will increase the $d2s\%$. When examining the curve in Figure 7, it can be seen that when the Reproducibility data points (square symbols) reach an approximate Recovery value of 10% the $d2s\%$ values increase significantly. Since recovery values of 10% or less are generally associated with unmodified asphalt binders, the $d2s\%$ values for Recovery were averaged using only data from modified asphalt binders where the average Recovery was greater than 10%. Thus, Binders A and B were not used in the determination of Repeatability and Reproducibility $d2s\%$ for Rec-0.1. Binders A, B, C, and C64 were not used in the determination of Repeatability and Reproducibility $d2s\%$ for Rec-3.2. The inclusion of Binders C and C64 in the Rec-0.1 calculation, but not the Rec-3.2 calculation, resulted in the Repeatability and Reproducibility $d2s\%$ values being higher for Rec-0.1 than for Rec-3.2.

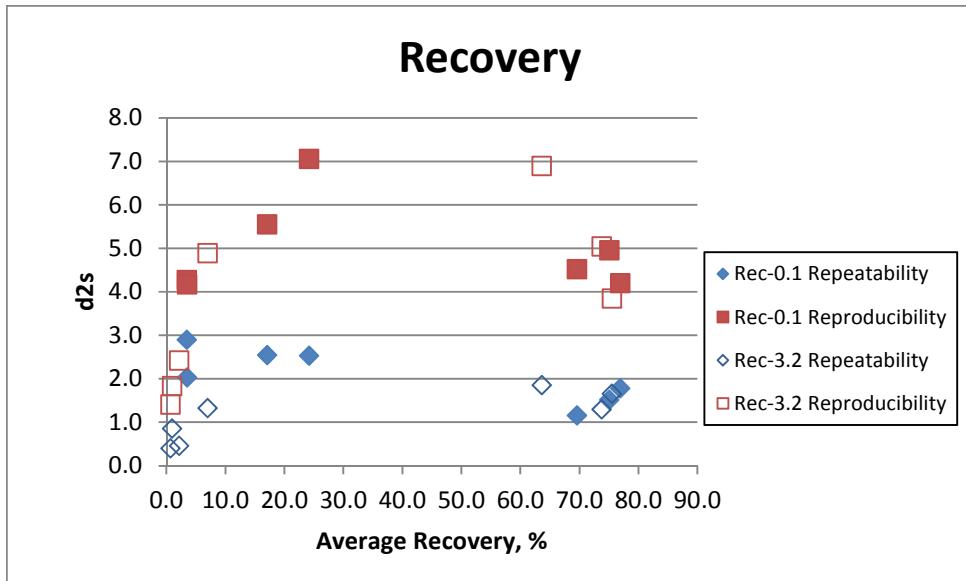


Figure 6: d2s as a Function of Recovery

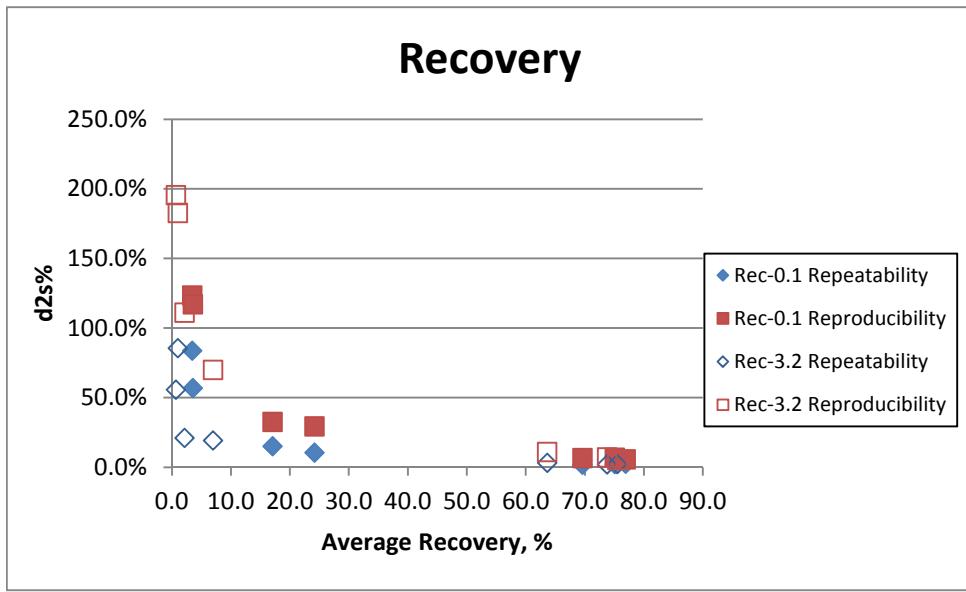


Figure 7: d2s% as a Function of Recovery

Figures 8 and 9 show the d2s and d2s% values as a function of Jnr-Diff value. As shown in Figure 8, the d2s shows no apparent trend as a function of Jnr-Diff value. However, in Figure 9, there does appear to be a relationship between d2s% and Jnr-Diff value – with higher d2s% associated with lower values of Jnr-Diff. For constant d2s values, a decrease in average value will increase the d2s%. By observation, the d2s% increases significantly when the Jnr-Diff value decreases below 10%. As such, the average values for repeatability and reproducibility for Jnr-Diff were calculated using only the data in Table 11 where the Jnr-Diff was 10% or greater.

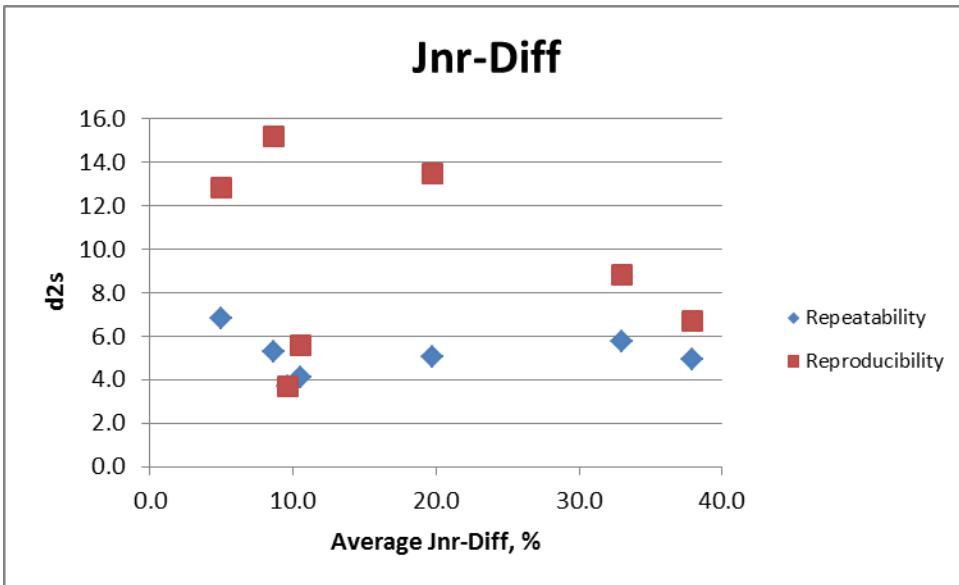


Figure 8: d2s as a Function of Jnr-Diff

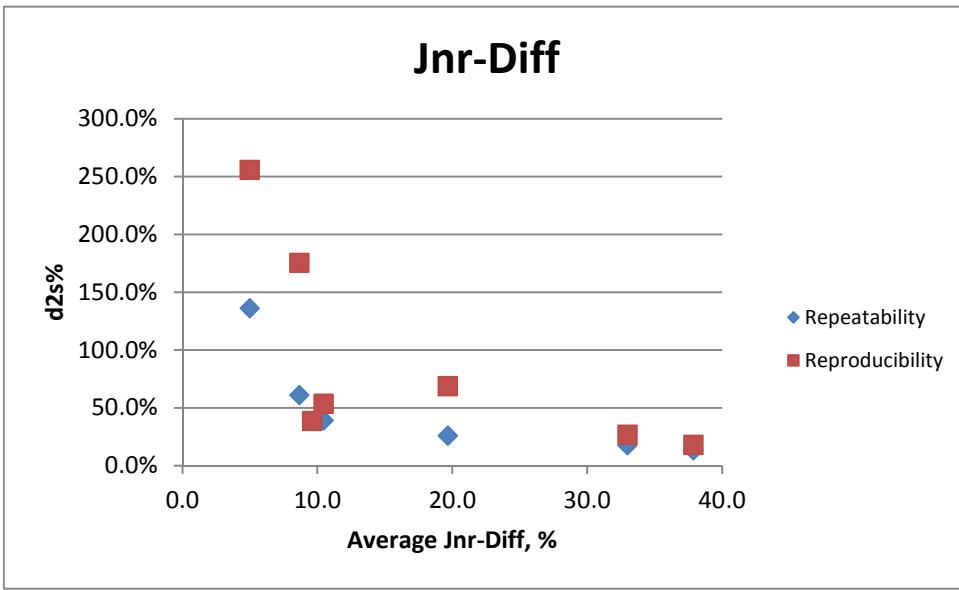


Figure 9: d2s% as a Function of Jnr-Diff

Table 12 provides a comparison of the 2010 NEAUPG MSCR ILS with the 2012 NEAUPG MSCR ILS.

Table 12: Comparison of 2010 and 2012 NEAUPG MSCR ILS

<i>Condition</i>	<i>Acceptable Range of Two Test Results (d2s%)</i> <i>2012 NEAUPG MSCR ILS</i>	<i>Acceptable Range of Two Test Results (d2s%)</i> <i>2010 NEAUPG MSCR ILS</i>
<i>Single-Operator Precision:</i> Rec-0.1 (Recovery at 0.1kPa) Rec-3.2 (Recovery at 3.2kPa)	2.0% ⁽¹⁾ 2.3% ⁽¹⁾	9.7% ⁽²⁾ 7.7% ⁽²⁾
<i>Multilaboratory Precision:</i> Rec-0.1 (Recovery at 0.1kPa) Rec-3.2 (Recovery at 3.2kPa)	6.2% ⁽¹⁾ 7.6% ⁽¹⁾	14.0% ⁽²⁾ 18.7% ⁽²⁾
<i>Single-Operator Precision:</i> Jnr-0.1 (J_{nr} at 0.1 kPa) Jnr-3.2 (J_{nr} at 3.2 kPa)	12.9% 11.6%	14.5% 14.5%
<i>Multilaboratory Precision:</i> Jnr-0.1 (J_{nr} at 0.1 kPa) Jnr-3.2 (J_{nr} at 3.2 kPa)	35.5% 33.0%	25.6% 33.7%
<i>Single-Operator Precision:</i> Jnr-Diff	23.8% ⁽³⁾	n/a ⁽⁴⁾
<i>Multilaboratory Precision:</i> Jnr-Diff	41.5% ⁽³⁾	n/a ⁽⁴⁾

(1) The reported precision estimates for Recovery were determined using only modified asphalt binders having an average value of 63-76% for the 2012 NEAUPG ILS.

(2) The reported precision estimates for Recovery were determined using only modified asphalt binders having an average value of 32-51% for the 2010 NEAUPG ILS.

(3) The reported precision estimates for Jnr-Diff were determined by averaging the d2s% of Jnr-Diff values that were 10% or greater.

(4) “n/a” means data was not available.

Summary

Twenty-eight (28) laboratories participated in the 2012 NEAUPG MSCR ILS, including Users (13 labs/DSRs), Producers (9 labs), and Industry/Academia (6 labs). Three modified and two unmodified asphalt binders were supplied to the participating labs along with testing instructions. Key findings are as follows:

- Precision estimates for Jnr are similar to the results obtained from the 2010 NEAUPG MSCR ILS and other ILS programs.

- Precision estimates for Recovery are lower than the estimates reported in the 2010 NEAUPG MSCR ILS. This may be related to the range of Recovery values which are higher in the 2012 ILS than in the 2010 ILS.
- Precision estimates for Jnr-Diff are higher than the estimates calculated for Jnr and Recovery. Precision estimates for Jnr-Diff were not determined in the 2010 NEAUPG MSCR ILS.

Acknowledgments

This material is based upon work supported by the U.S. Department of Transportation under Cooperative Agreement No. DTFH61-11-H-00033. Thanks to Michael Arasteh (FHWA) and John Bukowski (FHWA) for working with us on this project.

The information presented in this report would not have been possible without the willingness of the NEAUPG labs to provide data. Thanks to all the participating labs.

Finally, the support of the Member Companies of the Asphalt Institute is gratefully acknowledged. Without their interest and support, none of the work presented could have been accomplished.

Disclaimer

Any opinions, findings, and conclusions or recommendations expressed in this publication are those of the Author and do not necessarily reflect the view of the U.S. Department of Transportation, the Asphalt Institute and its individual Member Companies.

APPENDIX

Data with Outliers Removed

Binder A

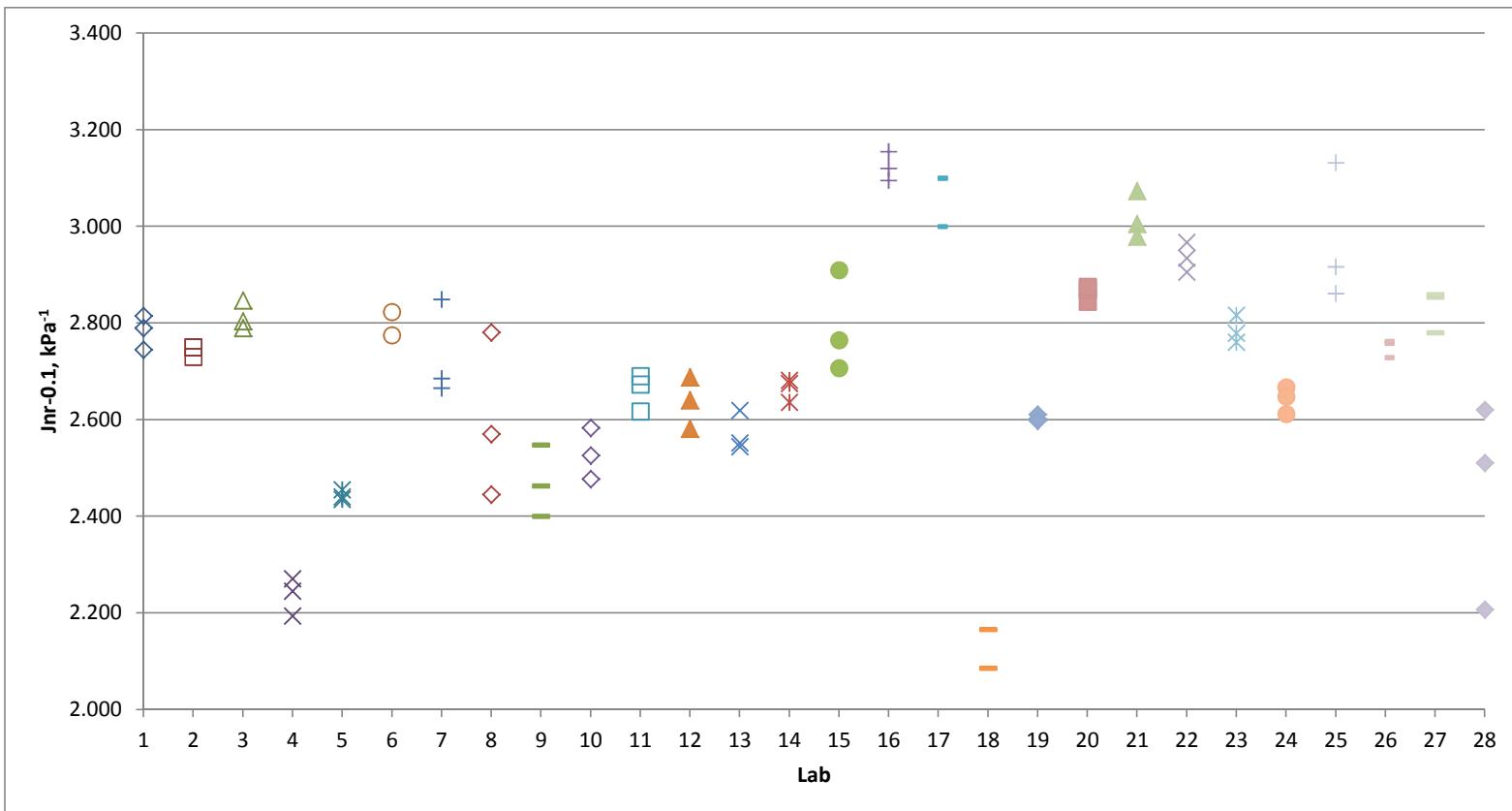
PG 58-28

Jnr (0.1 kPa)

Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		2.815	2.790	2.745	2.78320	0.03544	0.08191	0.35	0.48
2		2.750	2.730	2.750	2.74333	0.01155	0.04204	0.18	0.16
3		2.847	2.804	2.790	2.81367	0.02970	0.11237	0.49	0.40
4		2.194	2.271	2.245	2.23667	0.03917	-0.46463	-2.01	0.53
5		2.435	2.455	2.440	2.44333	0.01041	-0.25796	-1.12	0.14
6		2.775		2.823	2.79900	0.03394	0.09771	0.42	0.46
7		2.665	2.685	2.849	2.73300	0.10096	0.03171	0.14	1.37
8		2.781	2.570	2.445	2.59867	0.16982	-0.10263	-0.44	2.31
9		2.463	2.400	2.548	2.47033	0.07427	-0.23096	-1.00	1.01
10		2.526	2.477	2.583	2.52867	0.05305	-0.17263	-0.75	0.72
11		2.673	2.617	2.690	2.66000	0.03820	-0.04129	-0.18	0.52
12		2.640	2.688	2.581	2.63633	0.05359	-0.06496	-0.28	0.73
13		2.544	2.552	2.619	2.57167	0.04119	-0.12963	-0.56	0.56
14		2.636	2.681	2.675	2.66400	0.02443	-0.03729	-0.16	0.33
15		2.910	2.765	2.707	2.79400	0.10456	0.09271	0.40	1.42
16		3.095	3.120	3.155	3.12333	0.03014	0.42204	1.83	0.41
17		3.100	3.100	3.000	3.06667	0.05774	0.36537	1.58	0.79
18		2.166		2.086	2.12600	0.05657	-0.57529	-2.49	0.77
19		2.602	2.611	2.598	2.60367	0.00666	-0.09763	-0.42	0.09
20		2.844	2.869	2.875	2.86267	0.01644	0.16137	0.70	0.22
21		3.005	3.073	2.979	3.01900	0.04854	0.31771	1.38	0.66
22		2.905	2.934	2.967	2.93533	0.03102	0.23404	1.01	0.42
23		2.760	2.816	2.779	2.78500	0.02848	0.08371	0.36	0.39
24		2.667	2.648	2.612	2.64233	0.02793	-0.05896	-0.26	0.38
25		3.132	2.861	2.916	2.96967	0.14325	0.26837	1.16	1.95
26		2.758	2.729	2.762	2.74967	0.01801	0.04837	0.21	0.24
27		2.854	2.859	2.780	2.83100	0.04424	0.12971	0.56	0.60
28		2.621	2.207	2.511	2.44603	0.21425	-0.25526	-1.10	2.91

Average of Cell Averages
 Standard Deviation of Cell Averages
 Repeatability Standard Deviation
 Reproducibility Standard Deviation

X-bar	2.701
s _{X-bar}	0.231
s _r	0.07352
s _R	0.239
	0.239



Binder A

PG 58-28

Jnr (3.2 kPa)

Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		3.059	3.046	3.003	3.03597	0.02925	0.05172	0.21	0.41
2		3.000	2.990	3.000	2.99667	0.00577	0.01242	0.05	0.08
3		3.098	3.076	3.072	3.08200	0.01400	0.09775	0.40	0.20
4		2.439	2.436	2.478	2.45100	0.02343	-0.53325	-2.17	0.33
5		2.690	2.694	2.670	2.68467	0.01286	-0.29958	-1.22	0.18
6		3.063	2.987	3.104	3.05133	0.05937	0.06709	0.27	0.83
7		3.015	3.103	3.128	3.08200	0.05935	0.09775	0.40	0.83
8		2.995	2.852	2.654	2.83367	0.17124	-0.15058	-0.61	2.39
9		2.722	2.691	2.813	2.74200	0.06341	-0.24225	-0.99	0.89
10		2.788	2.748	2.833	2.78967	0.04252	-0.19458	-0.79	0.59
11		2.956	2.873	2.941	2.92333	0.04423	-0.06091	-0.25	0.62
12		2.921	2.947	2.879	2.91567	0.03431	-0.06858	-0.28	0.48
13		2.793	2.804	2.865	2.82067	0.03879	-0.16358	-0.67	0.54
14		2.926	3.022	2.939	2.96233	0.05208	-0.02191	-0.09	0.73
15		3.339	3.228		3.28350	0.07849	0.29925	1.22	1.10
16		3.363	3.391	3.455	3.40300	0.04716	0.41875	1.70	0.66
17		3.300	3.500	3.300	3.36667	0.11547	0.38242	1.55	1.61
18		2.470		2.375	2.42250	0.06718	-0.56175	-2.28	0.94
19		2.845	2.862	2.849	2.85200	0.00889	-0.13225	-0.54	0.12
20		3.102	3.127	3.145	3.12467	0.02159	0.14042	0.57	0.30
21		3.277	3.380	3.271	3.30933	0.06127	0.32509	1.32	0.86
22		3.224	3.206	3.240	3.22333	0.01701	0.23909	0.97	0.24
23		2.994	3.071	3.076	3.04700	0.04597	0.06275	0.26	0.64
24		2.992	2.947	3.006	2.98167	0.03083	-0.00258	-0.01	0.43
25		3.456	3.164	3.160	3.26000	0.16975	0.27575	1.12	2.37
26		3.025	2.997	3.038	3.02000	0.02095	0.03575	0.15	0.29
27		3.151	3.168	3.071	3.13000	0.05180	0.14575	0.59	0.72
28		2.913	2.593	2.786	2.76429	0.16131	-0.21996	-0.89	2.26

Average of Cell Averages

X-bar 2.984

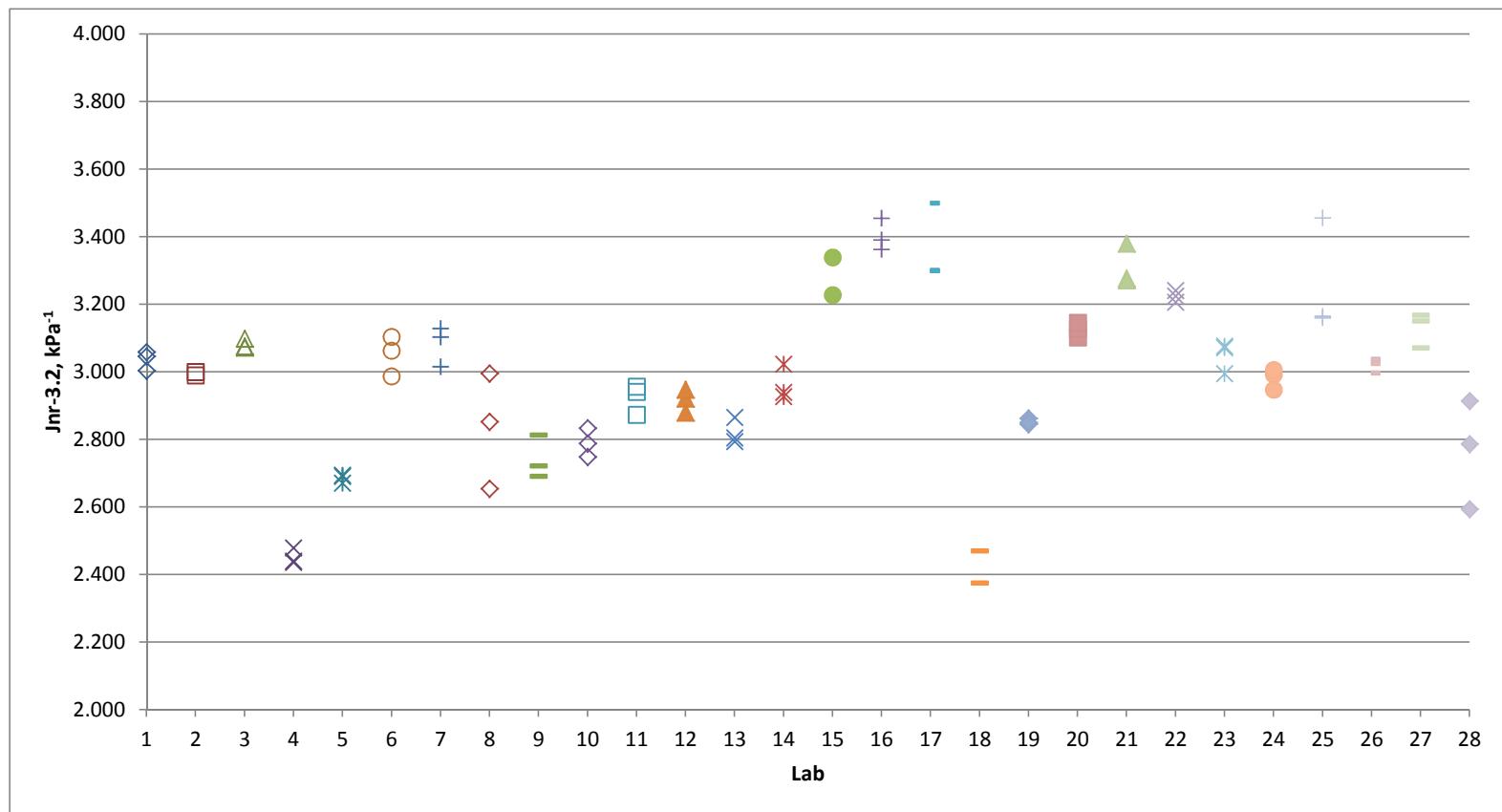
Standard Deviation of Cell Averages

$s_{X\text{-har}}$ 0.246

Repeatability Standard Deviation

s_r 0.07151 0.253

Reproducibility Standard Deviation



Binder A

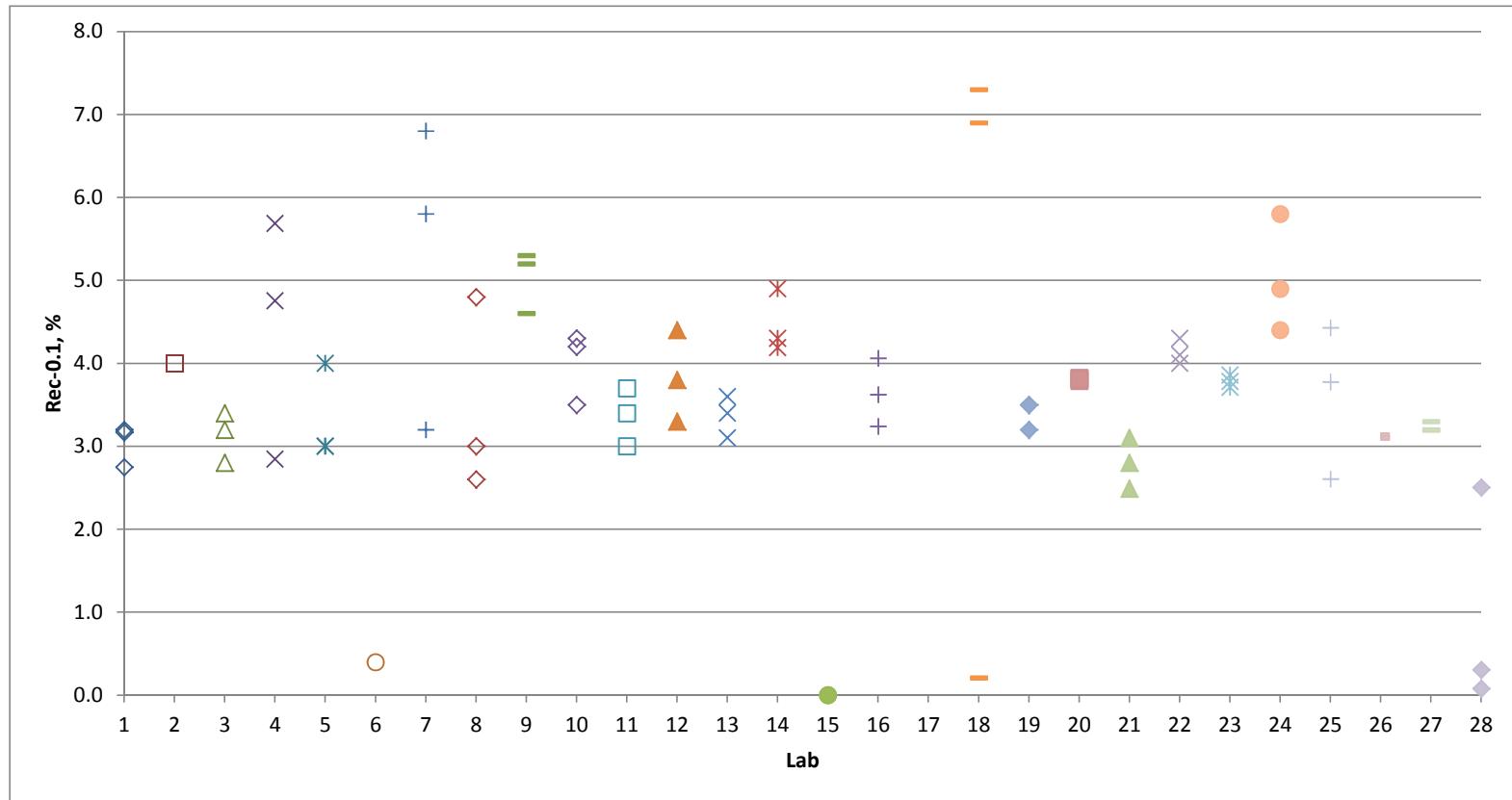
PG 58-28

Recovery (0.1 kPa)

Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		2.8	3.2	3.2	3.040	0.252	-0.421	-0.33	0.24
2		4.0	4.0	4.0	4.000	0.000	0.539	0.42	0.00
3		2.8	3.2	3.4	3.133	0.306	-0.327	-0.26	0.30
4		5.7	2.8	4.8	4.428	1.448	0.968	0.76	1.40
5		4.0	3.0	3.0	3.333	0.577	-0.127	-0.10	0.56
6			0.4	0.400			-3.061	-2.41	0.00
7		5.8	6.8	3.2	5.267	1.858	1.806	1.42	1.80
8		2.6	4.8	3.0	3.467	1.172	0.006	0.00	1.13
9		5.2	5.3	4.6	5.033	0.379	1.573	1.24	0.37
10		4.2	4.3	3.5	4.000	0.436	0.539	0.42	0.42
11		3.7	3.4	3.0	3.367	0.351	-0.094	-0.07	0.34
12		3.8	3.3	4.4	3.833	0.551	0.373	0.29	0.53
13		3.6	3.4	3.1	3.367	0.252	-0.094	-0.07	0.24
14		4.2	4.9	4.3	4.463	0.382	1.003	0.79	0.37
15		0.0	0.0	0.000	0.000	0.000	-3.461	-2.73	0.00
16		3.2	3.6	4.1	3.640	0.410	0.179	0.14	0.40
17									
18		6.9	0.2	7.3	4.803	3.983	1.343	1.06	3.86
19		3.2	3.5	3.5	3.400	0.173	-0.061	-0.05	0.17
20		3.8	3.8	3.8	3.809	0.018	0.348	0.27	0.02
21		2.5	3.1	2.8	2.797	0.305	-0.664	-0.52	0.30
22		4.0	4.1	4.3	4.133	0.153	0.673	0.53	0.15
23		3.9	3.7	3.8	3.783	0.075	0.323	0.25	0.07
24		4.9	4.4	5.8	5.033	0.709	1.573	1.24	0.69
25		3.8	4.4	2.6	3.601	0.923	0.140	0.11	0.89
26		3.1	3.1	3.1	3.113	0.023	-0.347	-0.27	0.02
27		3.2	3.3	3.2	3.233	0.058	-0.227	-0.18	0.06
28		0.3	2.5	0.1	0.964	1.340	-2.497	-1.97	1.30

Average of Cell Averages
 Standard Deviation of Cell Averages
 Repeatability Standard Deviation
 Reproducibility Standard Deviation

X-bar 3.461
 $s_{X\bar{x}}$ 1.270
 s_r 1.03259 1.524
 s_R 1.524



Binder A

PG 58-28

Recovery (3.2 kPa)

Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		0.3	0.4	0.4	0.36000	0.03000	-0.35720	-0.73	0.21
2		1.0	1.0	1.0	1.00000	0.00000	0.28280	0.58	0.00
3		0.3	0.4	0.4	0.36667	0.05774	-0.35053	-0.72	0.41
4		1.4	1.4	1.4	1.44600	0.00361	0.72880	1.50	0.03
5		1.2	1.2	1.2	1.20000	0.00000	0.48280	0.99	0.00
6		0.0	0.0	0.0	0.00000	0.00000	-0.71720	-1.47	0.00
7		0.4	0.4	0.2	0.33333	0.11547	-0.38386	-0.79	0.81
8		1.3	1.2	1.3	1.26667	0.05774	0.54947	1.13	0.41
9		1.6	1.1	1.0	1.23333	0.32146	0.51614	1.06	2.26
10		0.7	0.6	0.6	0.63333	0.05774	-0.08386	-0.17	0.41
11		0.4	0.2	0.4	0.33333	0.11547	-0.38386	-0.79	0.81
12		0.5	0.4	0.6	0.50000	0.10000	-0.21720	-0.45	0.70
13		0.5	0.5	0.5	0.50000	0.00000	-0.21720	-0.45	0.00
14		1.3	1.4	1.3	1.33667	0.05508	0.61947	1.27	0.39
15		0.0	0.0	0.0	0.00000	0.00000	-0.71720	-1.47	0.00
16		1.1	1.1	1.1	1.11667	0.01528	0.39947	0.82	0.11
17									
18		1.0	0.0	1.1	0.70000	0.60828	-0.01720	-0.04	4.28
19		0.5	0.5	0.5	0.50000	0.00000	-0.21720	-0.45	0.00
20		1.3	1.2	1.2	1.23367	0.01756	0.51647	1.06	0.12
21		0.3	0.2	0.3	0.26667	0.05774	-0.45053	-0.93	0.41
22		1.2	1.2	1.2	1.20000	0.00000	0.48280	0.99	0.00
23		1.3	1.2	1.2	1.25667	0.02887	0.53947	1.11	0.20
24		1.2	1.2	1.3	1.23333	0.05774	0.51614	1.06	0.41
25		0.9	1.0	1.0	0.98130	0.03064	0.26410	0.54	0.22
26		0.5	0.3	0.3	0.36667	0.11547	-0.35053	-0.72	0.81
27		0.0	0.0	0.0	0.00000	0.00000	-0.71720	-1.47	0.00
28		0.0	0.0	0.0	0.00000	0.00000	-0.71720	-1.47	0.00

Average of Cell Averages

X-bar 0.717

Standard Deviation of Cell Averages

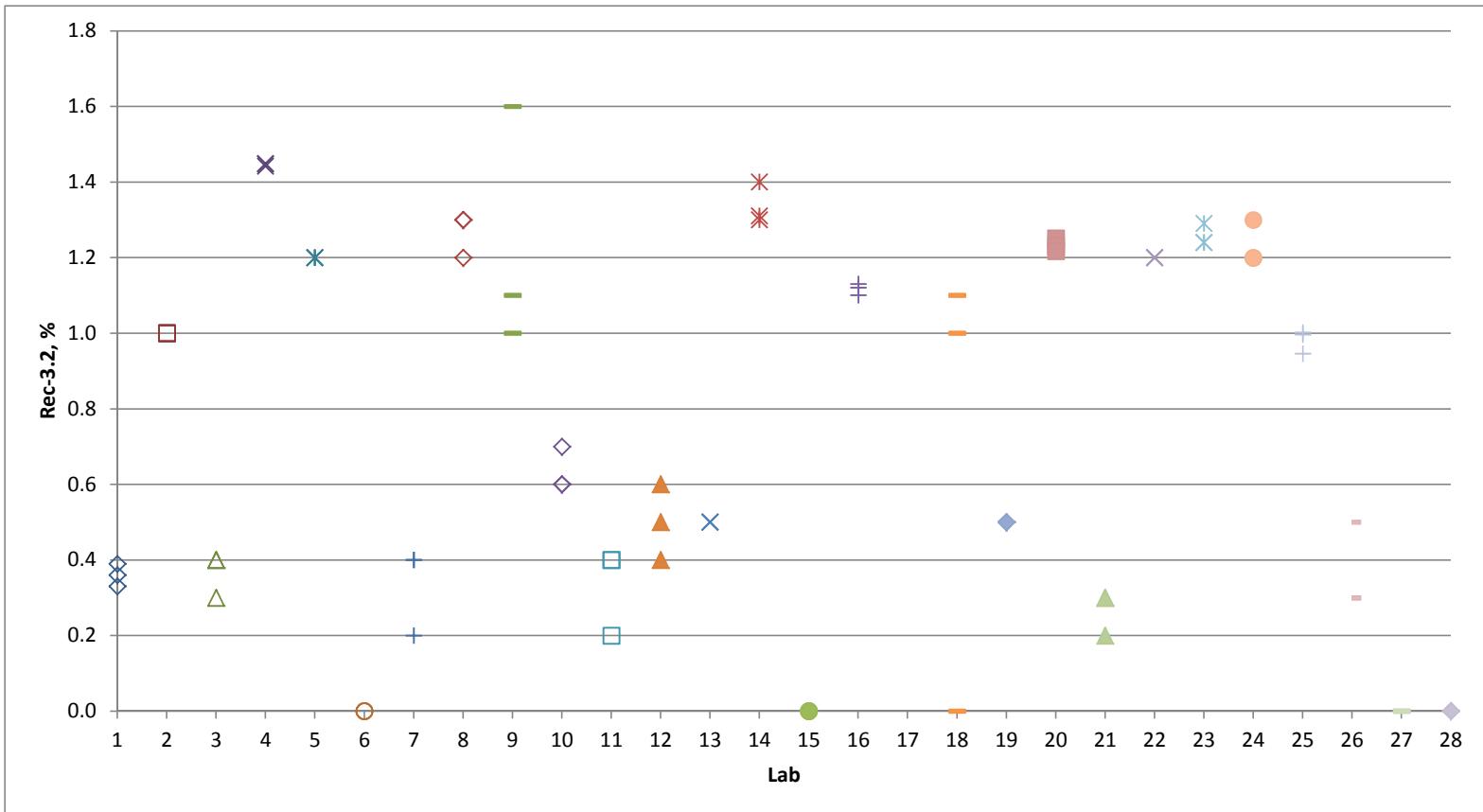
s_{X-bar} 0.487

Repeatability Standard Deviation

s_r 0.14224 0.500

Reproducibility Standard Deviation

s_R 0.500



Binder A

PG 58-28

Jnr-Diff

Lab No.	Lab Name	Results, x			Average	s	d	h	k	
		1	2	3						
1		8.660	9.190	9.400	9.08333	0.38136	-1.40680	-0.88	0.26	
2		9.091	9.524	9.091	9.23521	0.24994	-1.25493	-0.79	0.17	
3		8.819	9.683	10.118	9.54000	0.66120	-0.95013	-0.60	0.45	
4		11.130	7.245	10.380	9.58500	2.06090	-0.90513	-0.57	1.41	
5		9.500	8.880	8.610	8.99667	0.45633	-1.49347	-0.94	0.31	
6		10.370			9.984	10.17700	0.27294	-0.31313	-0.20	0.19
7		13.129	15.562	9.808	12.83300	2.88840	2.34287	1.47	1.97	
8		7.690	10.960	8.542	9.06400	1.69635	-1.42613	-0.89	1.16	
9		10.510	12.130	10.390	11.01000	0.97180	0.51987	0.33	0.66	
10		10.372	10.954	9.681	10.33567	0.63728	-0.15447	-0.10	0.43	
11		10.580	9.753	9.354	9.89567	0.62533	-0.59447	-0.37	0.43	
12		10.645	9.648	11.541	10.61133	0.94695	0.12120	0.08	0.65	
13		9.819	9.864	9.382	9.68833	0.26624	-0.80180	-0.50	0.18	
14		11.017	12.684	9.848	11.18300	1.42527	0.69287	0.43	0.97	
15		14.750	16.760		15.75500	1.42128	5.26487	3.30	0.97	
16		10.447	8.669	9.501	9.53900	0.88961	-0.95113	-0.60	0.61	
17		9.400	14.200	9.500	11.03333	2.74287	0.54320	0.34	1.87	
18		14.064	9.471	13.887	12.47400	2.60218	1.98387	1.24	1.78	
19		9.310	9.607	9.655	9.52400	0.18688	-0.96613	-0.61	0.13	
20		9.076	8.989	9.395	9.15333	0.21376	-1.33680	-0.84	0.15	
21		9.000	10.000	9.800	9.60000	0.52915	-0.89013	-0.56	0.36	
22		10.966	9.248	9.208	9.80733	1.00363	-0.68280	-0.43	0.68	
23		8.448	9.071	10.702	9.40700	1.16396	-1.08313	-0.68	0.79	
24		12.160	11.270	15.050	12.82667	1.97622	2.33653	1.46	1.35	
25		10.340	10.590	8.385	9.77167	1.20738	-0.71847	-0.45	0.82	
26		9.703	9.850	9.973	9.84200	0.13518	-0.64813	-0.41	0.09	
27		10.400	10.800	10.400	10.53333	0.23094	0.04320	0.03	0.16	
28		11.179	17.500	10.978	13.21890	3.70849	2.72876	1.71	2.53	

Average of Cell Averages

X-bar 10.490

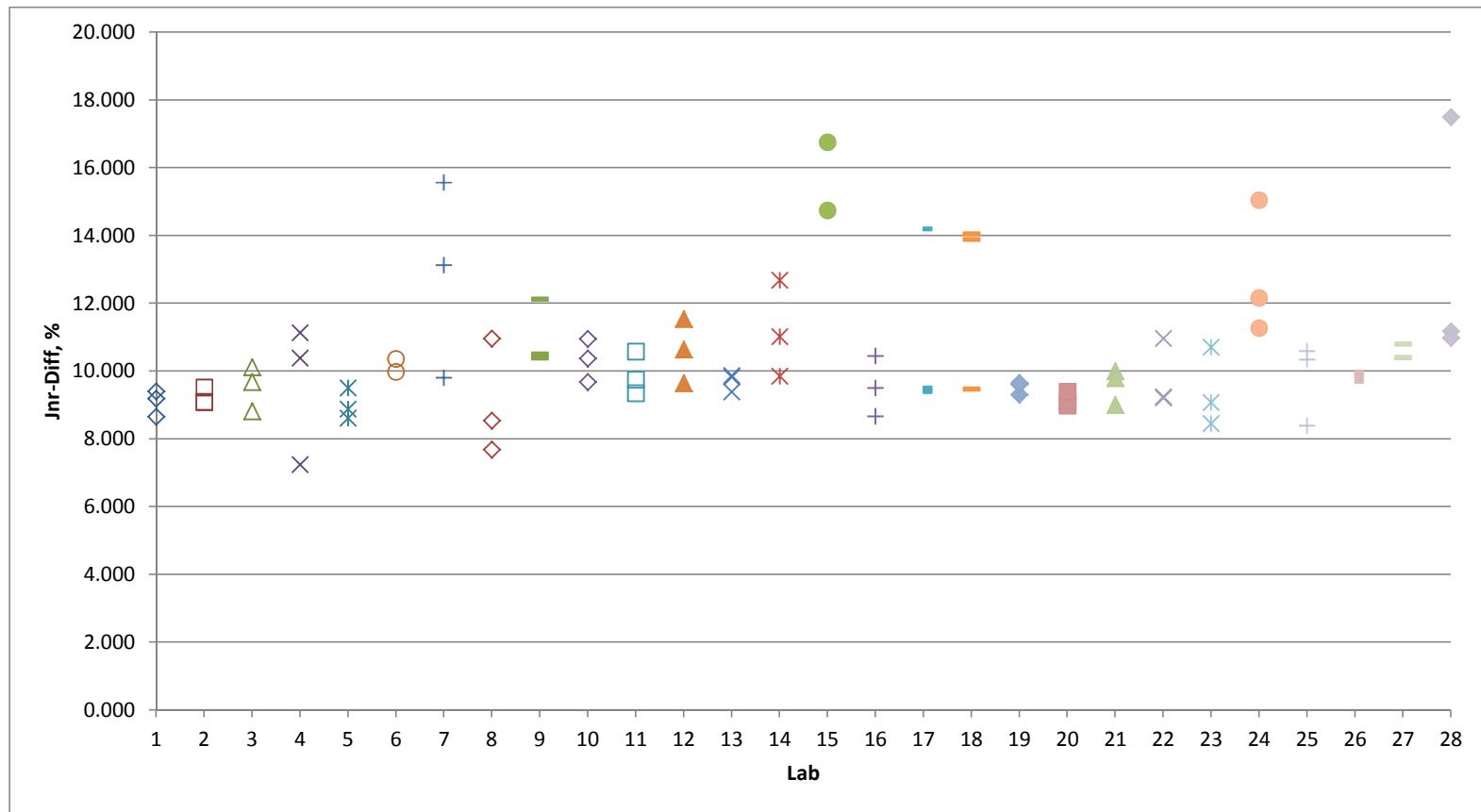
Standard Deviation of Cell Averages

$s_{X\text{-har}}$ 1.596

Repeatability Standard Deviation

s_r 1.46571 1.995

Reproducibility Standard Deviation



Binder B

PG 64-22

Jnr (0.1 kPa)

Lab No.	Lab Name	Results, x							
		1	2	3	Average	s	d	h	k
1		2.434	2.441	2.423	2.43280	0.00911	0.07733	0.37	0.10
2		2.280	2.260	2.230	2.25667	0.02517	-0.09880	-0.47	0.28
3		2.423	2.461	2.486	2.45667	0.03172	0.10120	0.48	0.35
4		1.830	1.873	1.928	1.87700	0.04912	-0.47847	-2.29	0.55
5		2.080	2.063		2.07150	0.01202	-0.28397	-1.36	0.13
6		2.470	2.461	2.558	2.49633	0.05359	0.14086	0.67	0.60
7		2.049	2.478	2.524	2.35033	0.26197	-0.00514	-0.02	2.93
8		2.194	2.183	2.101	2.15933	0.05082	-0.19614	-0.94	0.57
9		2.174	2.151		2.16250	0.01626	-0.19297	-0.92	0.18
10		2.225	2.295	2.361	2.29367	0.06801	-0.06180	-0.30	0.76
11		2.393	2.398	2.470	2.42033	0.04309	0.06486	0.31	0.48
12		2.431	2.326	2.355	2.37067	0.05422	0.01520	0.07	0.61
13		2.298	2.341	2.394	2.34433	0.04809	-0.01114	-0.05	0.54
14		2.547	2.456	2.536	2.51300	0.04967	0.15753	0.75	0.56
15		2.537	2.028	2.117	2.22733	0.27185	-0.12814	-0.61	3.04
16		2.619	2.717	2.639	2.65833	0.05178	0.30286	1.45	0.58
17		2.600	2.600	2.600	2.60000	0.00000	0.24453	1.17	0.00
18		1.709	1.954	1.814	1.82567	0.12292	-0.52980	-2.54	1.37
19		2.358	2.307	2.338	2.33433	0.02570	-0.02114	-0.10	0.29
20		2.413	2.436	2.388	2.41233	0.02401	0.05686	0.27	0.27
21		2.760	2.739	2.790	2.76300	0.02563	0.40753	1.95	0.29
22		2.484	2.451	2.469	2.46800	0.01652	0.11253	0.54	0.18
23		2.483	2.448	2.399	2.44333	0.04219	0.08786	0.42	0.47
24		2.422	2.331	2.345	2.36600	0.04900	0.01053	0.05	0.55
25		2.446	2.631	2.495	2.52400	0.09585	0.16853	0.81	1.07
26		2.465	2.509	2.497	2.49033	0.02274	0.13486	0.65	0.25
27		2.422	2.321	2.549	2.43067	0.11425	0.07520	0.36	1.28
28		2.257	2.270	2.087	2.20470	0.10196	-0.15077	-0.72	1.14

Average of Cell Averages

X-bar 2.355

Standard Deviation of Cell Averages

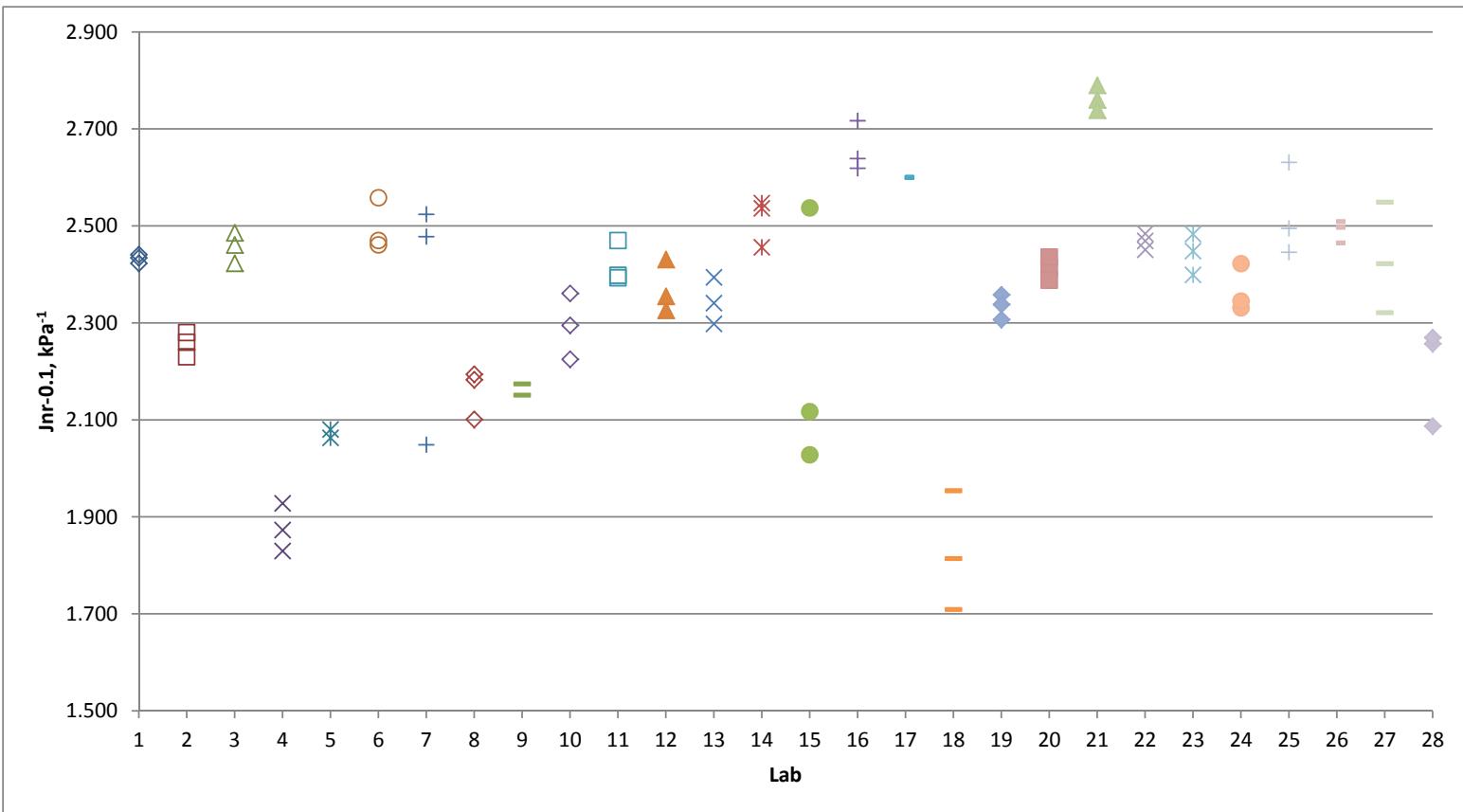
s_{X-bar} 0.209

Repeatability Standard Deviation

s_r 0.08945 0.221

Reproducibility Standard Deviation

s_R 0.221



Binder B

PG 64-22

Jnr (3.2 kPa)

Lab No.	Lab Name	Results, x							
		1	2	3	Average	s	d	h	k
1		2.656	2.652	2.656	2.65440	0.00252	0.06148	0.27	0.03
2		2.480	2.480	2.410	2.45667	0.04041	-0.13625	-0.60	0.45
3		2.648	2.677	2.697	2.67400	0.02464	0.08108	0.36	0.27
4		2.030	2.049	2.100	2.05967	0.03620	-0.53325	-2.35	0.40
5		2.289	2.291	2.29000	0.00141	-0.30292	-1.33	0.02	
6		2.730	2.651	2.769	2.71667	0.06012	0.12375	0.54	0.67
7		2.587	2.816	2.739	2.71400	0.11653	0.12108	0.53	1.30
8		2.390	2.369	2.323	2.36067	0.03427	-0.23225	-1.02	0.38
9		2.399	2.390	2.39450	0.00636	-0.19842	-0.87	0.07	
10		2.435	2.518	2.598	2.51700	0.08150	-0.07592	-0.33	0.91
11		2.613	2.648	2.697	2.65267	0.04219	0.05975	0.26	0.47
12		2.676	2.558	2.584	2.60600	0.06200	0.01308	0.06	0.69
13		2.533	2.545	2.622	2.56667	0.04829	-0.02625	-0.12	0.54
14		2.829	2.680	2.799	2.76933	0.07881	0.17641	0.78	0.88
15		2.950	2.345	2.446	2.58033	0.32410	-0.01259	-0.06	3.61
16		2.882	3.032	2.893	2.93567	0.08361	0.34275	1.51	0.93
17		2.800	2.900	2.900	2.86667	0.05774	0.27375	1.21	0.64
18		1.814	2.099	2.094	2.00233	0.16312	-0.59059	-2.60	1.82
19		2.584	2.517	2.548	2.54967	0.03353	-0.04325	-0.19	0.37
20		2.625	2.655	2.598	2.62600	0.02851	0.03308	0.15	0.32
21		3.005	2.995	3.035	3.01167	0.02082	0.41875	1.84	0.23
22		2.749	2.722	2.725	2.73200	0.01480	0.13908	0.61	0.17
23		2.703	2.648	2.633	2.66133	0.03686	0.06841	0.30	0.41
24		2.692	2.558	2.606	2.61867	0.06789	0.02575	0.11	0.76
25		2.699	2.797	2.725	2.74033	0.05077	0.14741	0.65	0.57
26		2.707	2.759	2.740	2.73533	0.02631	0.14241	0.63	0.29
27		2.671	2.585	2.795	2.68367	0.10557	0.09075	0.40	1.18
28		2.483	2.520	2.275	2.42589	0.13215	-0.16703	-0.74	1.47

Average of Cell Averages

X-bar 2.593

Standard Deviation of Cell Averages

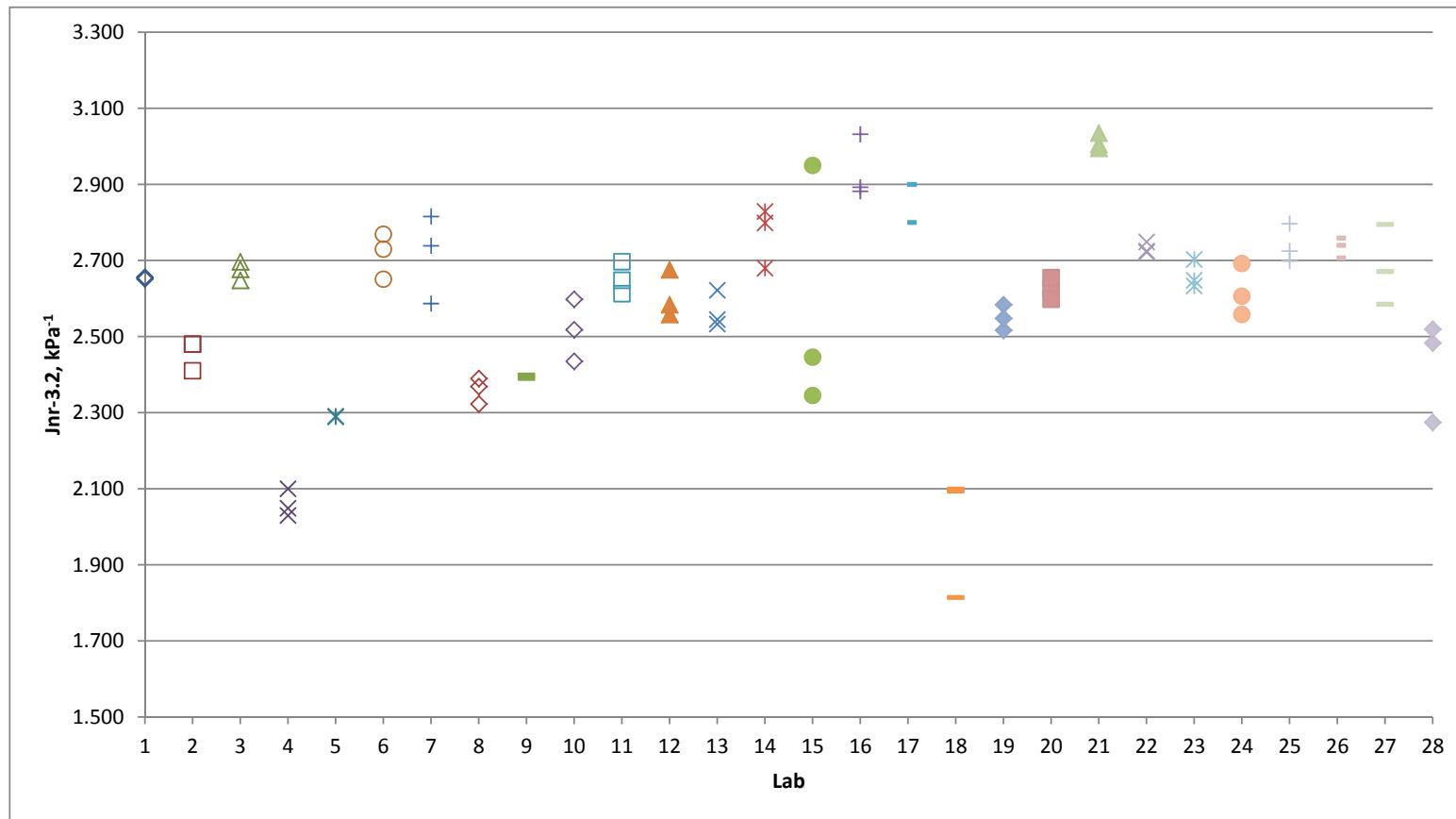
s_{X-bar} 0.227

Repeatability Standard Deviation

s_r 0.08968 0.239

Reproducibility Standard Deviation

s_R 0.239



Binder B

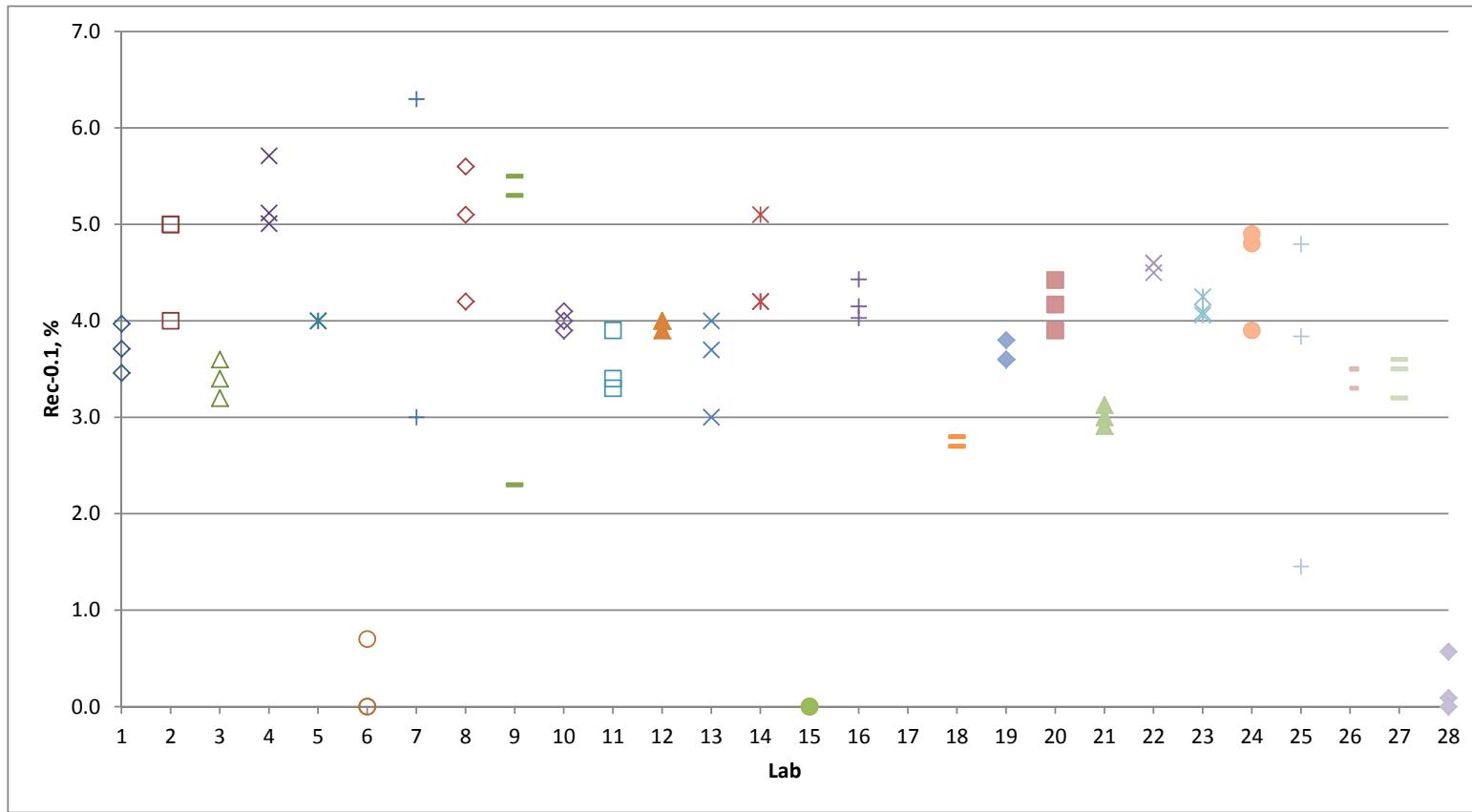
PG 64-22

Recovery (0.1 kPa)

Lab No.	Lab Name	Results, x							
		1	2	3	Average	s	d	h	k
1		3.7	3.5	4.0	3.713	0.255	0.146	0.11	0.35
2		5.0	4.0	5.0	4.667	0.577	1.099	0.80	0.80
3		3.6	3.4	3.2	3.400	0.200	-0.167	-0.12	0.28
4		5.7	5.0	5.1	5.279	0.379	1.712	1.25	0.52
5			4.0	4.0	4.000	0.000	0.433	0.32	0.00
6		0.0	0.7	0.0	0.233	0.404	-3.334	-2.44	0.56
7			6.3	3.0	4.650	2.333	1.083	0.79	3.23
8		4.2	5.1	5.6	4.967	0.709	1.399	1.02	0.98
9		5.5	5.3	2.3	4.367	1.793	0.799	0.59	2.48
10		3.9	4.0	4.1	4.000	0.100	0.433	0.32	0.14
11		3.4	3.9	3.3	3.533	0.321	-0.034	-0.02	0.44
12		3.9	4.0	4.0	3.967	0.058	0.399	0.29	0.08
13		4.0	3.0	3.7	3.567	0.513	-0.001	0.00	0.71
14		5.1	4.2	4.2	4.500	0.520	0.933	0.68	0.72
15		0.0	0.0	0.0	0.000	0.000	-3.567	-2.61	0.00
16		4.0	4.4	4.2	4.203	0.205	0.636	0.47	0.28
17									
18		2.7	2.8		2.750	0.071	-0.817	-0.60	0.10
19		3.8	3.6	3.6	3.667	0.115	0.099	0.07	0.16
20		4.2	4.4	3.9	4.163	0.262	0.596	0.44	0.36
21		3.0	3.1	2.9	3.013	0.110	-0.555	-0.41	0.15
22		4.6	4.6	4.5	4.567	0.058	0.999	0.73	0.08
23		4.1	4.3	4.1	4.133	0.102	0.566	0.41	0.14
24		4.8	3.9	4.9	4.533	0.551	0.966	0.71	0.76
25		4.8	1.5	3.8	3.362	1.721	-0.205	-0.15	2.38
26		3.5	3.5	3.3	3.433	0.115	-0.134	-0.10	0.16
27		3.6	3.5	3.2	3.433	0.208	-0.134	-0.10	0.29
28		0.1	0.6	0.0	0.221	0.306	-3.347	-2.45	0.42

Average of Cell Averages
 Standard Deviation of Cell Averages
 Repeatability Standard Deviation
 Reproducibility Standard Deviation

X-bar	3.567
s _{X-bar}	1.366
s _r	0.72336
s _R	1.488



Binder B

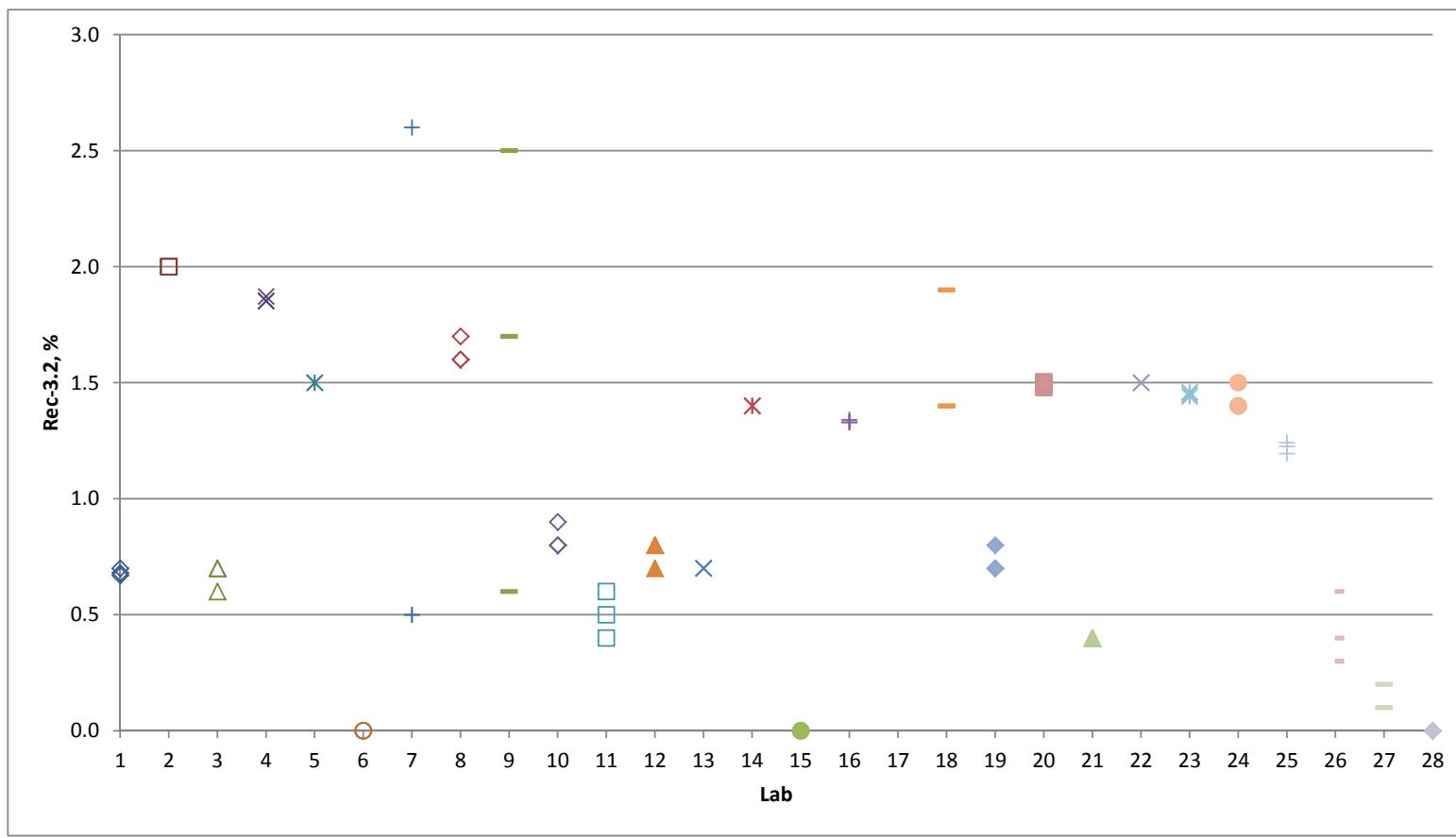
PG 64-22

Recovery (3.2 kPa)

Lab No.	Lab Name	Results, x								
		1	2	3	Average	s	d	h	k	
1		0.7	0.7	0.7	0.68333	0.01528	-0.31812	-0.53	0.05	
2		2.0	2.0	2.0	2.00000	0.00000	0.99854	1.66	0.00	
3		0.7	0.7	0.6	0.66667	0.05774	-0.33479	-0.56	0.19	
4		1.9	1.9	1.9	1.85900	0.01136	0.85754	1.42	0.04	
5		1.5	1.5	1.5	1.50000	0.00000	0.49854	0.83	0.00	
6		0.0	0.0	0.0	0.00000	0.00000	-1.00146	-1.66	0.00	
7		2.6	0.5	0.5	1.20000	1.21244	0.19854	0.33	3.97	
8		1.6	1.6	1.7	1.63333	0.05774	0.63188	1.05	0.19	
9		1.7	0.6	2.5	1.60000	0.95394	0.59854	0.99	3.12	
10		0.8	0.9	0.8	0.83333	0.05774	-0.16812	-0.28	0.19	
11		0.5	0.4	0.6	0.50000	0.10000	-0.50146	-0.83	0.33	
12		0.7	0.8	0.8	0.76667	0.05774	-0.23479	-0.39	0.19	
13		0.7	0.7	0.7	0.70000	0.00000	-0.30146	-0.50	0.00	
14		1.4	1.4	1.4	1.40000	0.00000	0.39854	0.66	0.00	
15		0.0	0.0	0.0	0.00000	0.00000	-1.00146	-1.66	0.00	
16		1.3	1.3	1.3	1.33333	0.00577	0.33188	0.55	0.02	
17										
18		1.9	1.4	1.4	1.56667	0.28868	0.56521	0.94	0.94	
19		0.7	0.8	0.7	0.73333	0.05774	-0.26812	-0.44	0.19	
20		1.5	1.5	1.5	1.49267	0.01266	0.49121	0.81	0.04	
21		0.4	0.4	0.4	0.40000	0.00000	-0.60146	-1.00	0.00	
22		1.5	1.5	1.5	1.50000	0.00000	0.49854	0.83	0.00	
23		1.5	1.4	1.5	1.45000	0.01000	0.44854	0.74	0.03	
24		1.4	1.5	1.4	1.43333	0.05774	0.43188	0.72	0.19	
25		1.2	1.2	1.2	1.22100	0.02390	0.21954	0.36	0.08	
26		0.6	0.4	0.3	0.43333	0.15275	-0.56812	-0.94	0.50	
27		0.2	0.1	0.1	0.13333	0.05774	-0.86812	-1.44	0.19	
28		0.0	0.0	0.0	0.00000	0.00000	-1.00146	-1.66	0.00	

Average of Cell Averages
 Standard Deviation of Cell Averages
 Repeatability Standard Deviation
 Reproducibility Standard Deviation

X-bar	1.001
s _{X-bar}	0.603
s _r	0.30558
s _R	0.652



Binder B

PG 64-22

Jnr-Diff

Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		9.100	8.630	9.600	9.11000	0.48508	-0.52297	-0.73	0.37
2		8.772	9.735	8.072	8.85940	0.83483	-0.77357	-1.08	0.63
3		9.284	8.795	8.460	8.84633	0.41439	-0.78664	-1.10	0.31
4		10.920	9.404	8.952	9.75867	1.03082	0.12570	0.18	0.78
5		7.570	9.110	9.940	8.87333	1.20259	-0.75964	-1.06	0.91
6		10.530		8.251	9.39050	1.61150	-0.24247	-0.34	1.22
7		13.665	8.512	11.08850	3.64372	1.45553	2.04	2.75	
8		8.930	10.040	10.550	9.84000	0.82831	0.20703	0.29	0.63
9		10.310	11.140	10.700	10.71667	0.41525	1.08370	1.52	0.31
10		9.407	9.744	10.045	9.73200	0.31917	0.09903	0.14	0.24
11		9.173	10.436	9.221	9.61000	0.71574	-0.02297	-0.03	0.54
12		10.062	10.004	9.753	9.93967	0.16424	0.30670	0.43	0.12
13		10.226	8.715	9.529	9.49000	0.75625	-0.14297	-0.20	0.57
14		11.076	9.128	10.370	10.19133	0.98621	0.55836	0.78	0.74
15									
16		10.003	11.609	9.633	10.41500	1.05045	0.78203	1.10	0.79
17		9.200	9.400	8.900	9.16667	0.25166	-0.46630	-0.65	0.19
18		6.111	6.897	13.374	8.79400	3.98582	-0.83897	-1.18	3.01
19		9.575	9.068	9.013	9.21867	0.30982	-0.41430	-0.58	0.23
20		8.798	8.988	8.782	8.85600	0.11459	-0.77697	-1.09	0.09
21		8.900	9.400	8.700	9.00000	0.36056	-0.63297	-0.89	0.27
22		10.658	11.059	10.375	10.69733	0.34369	1.06436	1.49	0.26
23		8.828	8.200	9.730	8.91933	0.76908	-0.71364	-1.00	0.58
24		11.190	9.727	11.140	10.68567	0.83061	1.05270	1.48	0.63
25		10.320	6.299	9.242	8.62033	2.08134	-1.01264	-1.42	1.57
26		9.781	9.949	9.708	9.81267	0.12358	0.17970	0.25	0.09
27		10.300	11.400	9.660	10.45333	0.88008	0.82036	1.15	0.66
28		10.022	11.007	8.985	10.00477	1.01078	0.37180	0.52	0.76

Average of Cell Averages

X-bar 9.633

Standard Deviation of Cell Averages

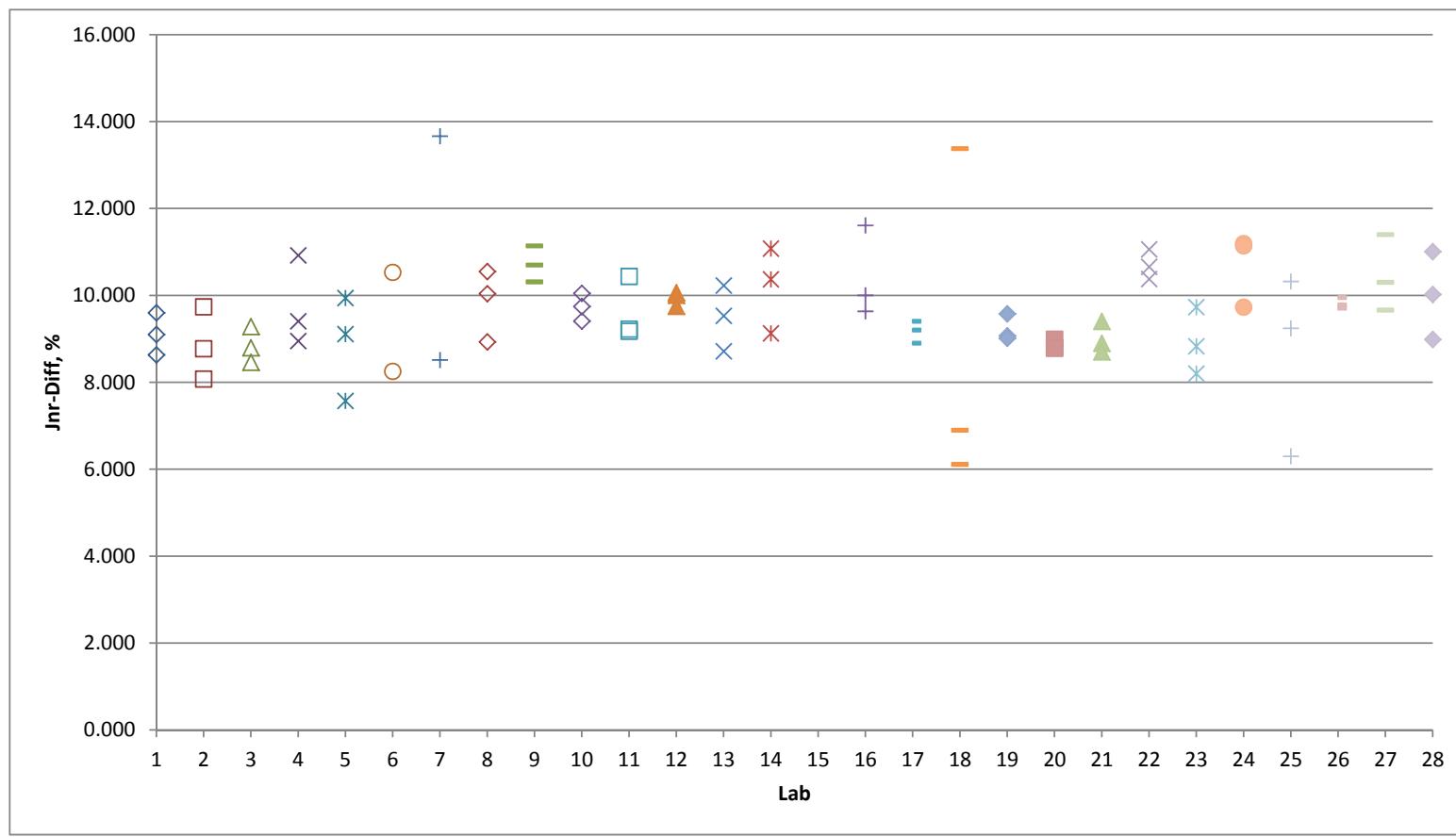
s_{X-bar} 0.714

Repeatability Standard Deviation

s_r 1.32450 1.296

Reproducibility Standard Deviation

s_R 1.325



Binder C

PG 64-28 (58C)

Jnr (0.1 kPa)

Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		1.029	1.035	1.029	1.03077	0.00323	0.02590	0.21	0.06
2		0.980	0.970	1.010	0.98667	0.02082	-0.01820	-0.15	0.40
3		0.992	0.947	0.976	0.97167	0.02281	-0.03320	-0.28	0.44
4		0.812	0.799	0.810	0.80727	0.00704	-0.19760	-1.64	0.14
5		0.962	0.942	0.945	0.94967	0.01079	-0.05520	-0.46	0.21
6									
7		1.090	1.010	1.050	1.05000	0.04000	0.04513	0.37	0.77
8		1.074	1.128	1.008	1.07000	0.06010	0.06513	0.54	1.16
9		0.876	0.881	0.871	0.87600	0.00500	-0.12887	-1.07	0.10
10		0.928	0.904	0.969	0.93367	0.03287	-0.07120	-0.59	0.63
11		0.954	0.905	0.857	0.90533	0.04850	-0.09954	-0.82	0.94
12		0.989	0.990	0.975	0.98467	0.00839	-0.02020	-0.17	0.16
13		0.872	0.870	0.873	0.87167	0.00153	-0.13320	-1.10	0.03
14		1.052	1.044	1.003	1.03300	0.02629	0.02813	0.23	0.51
15		1.094	1.051	0.911	1.01867	0.09569	0.01380	0.11	1.85
16		1.177	1.138	1.116	1.14367	0.03089	0.13880	1.15	0.60
17		1.100	1.100	0.820	1.00667	0.16166	0.00180	0.01	3.12
18		0.794	0.808	0.679	0.76033	0.07078	-0.24454	-2.03	1.37
19		0.922	0.866	0.878	0.88867	0.02948	-0.11620	-0.96	0.57
20		1.170	1.296	1.259	1.24167	0.06476	0.23680	1.96	1.25
21		1.114	1.059	1.158	1.11033	0.04960	0.10546	0.87	0.96
22		1.035	1.023	1.054	1.03733	0.01563	0.03246	0.27	0.30
23		1.271	1.205	1.218	1.23133	0.03496	0.22646	1.88	0.67
24		1.010	0.965	0.894	0.95633	0.05848	-0.04854	-0.40	1.13
25		1.187	1.284	1.292	1.25433	0.05845	0.24946	2.07	1.13
26		0.994	0.995	1.057	1.01533	0.03609	0.01046	0.09	0.70
27		0.988	1.031	0.930	0.98300	0.05069	-0.02187	-0.18	0.98
28		1.043	0.979	1.019	1.01344	0.03262	0.00857	0.07	0.63

Average of Cell Averages

X-bar 1.005

Standard Deviation of Cell Averages

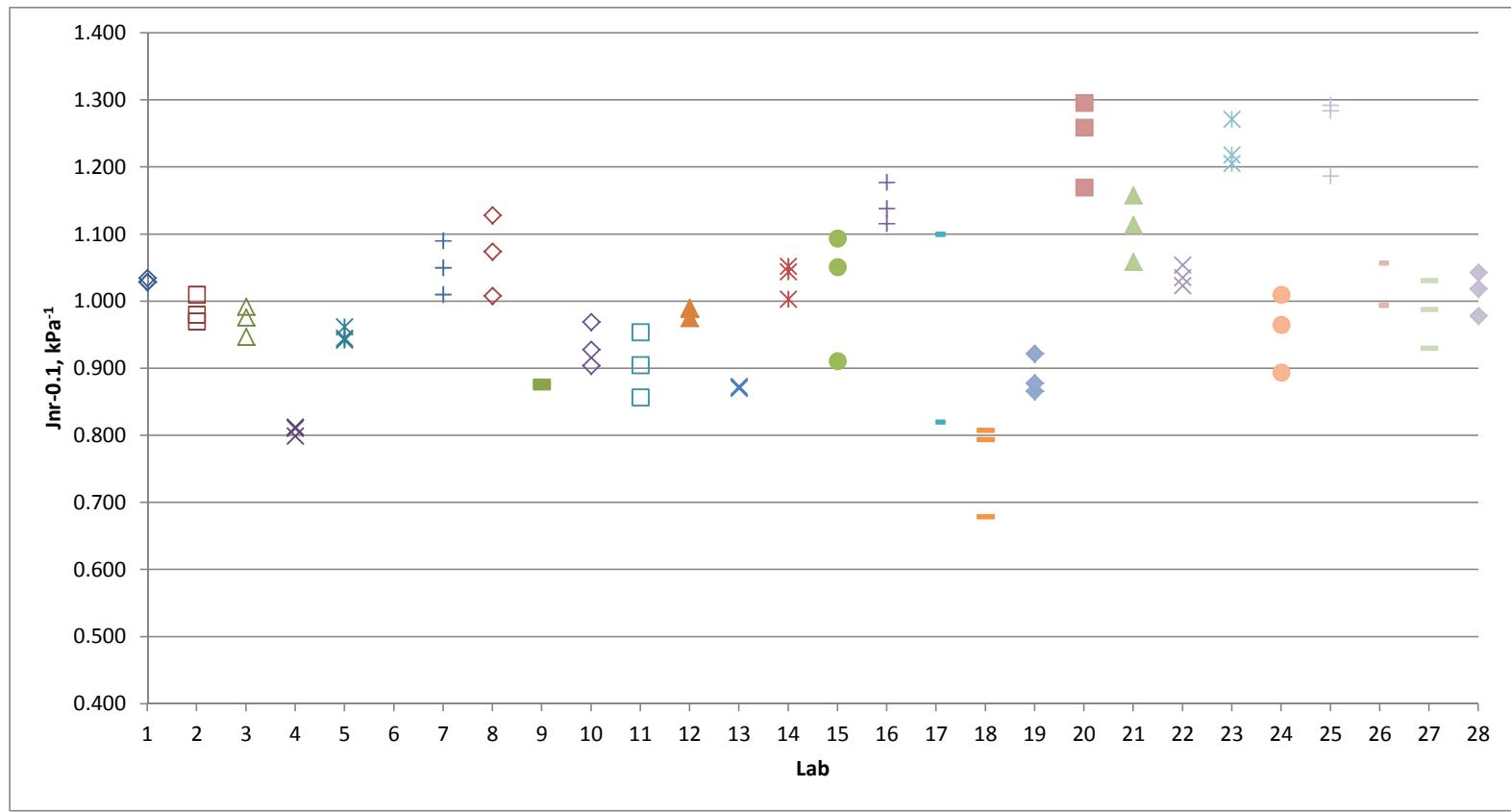
s_{X-bar} 0.121

Repeatability Standard Deviation

s_r 0.05185 0.128

Reproducibility Standard Deviation

s_R 0.128



Binder C

PG 64-28 (58C)**Jnr (3.2 kPa)**

Lab No.	Lab Name	Results, x					h	k
		1	2	3	Average	s		
1		1.347	1.358	1.347	1.35057	0.00670	0.00673	0.04
2		1.290	1.250	1.310	1.28333	0.03055	-0.06050	-0.36
3		1.299	1.282	1.312	1.29767	0.01504	-0.04617	-0.28
4		1.062	1.033	1.070	1.05500	0.01947	-0.28883	-1.72
5		1.194	1.166	1.170	1.17667	0.01514	-0.16717	-1.00
6		1.559	1.457	1.519	1.51167	0.05139	0.16783	1.00
7		1.401	1.336	1.405	1.38067	0.03873	0.03683	0.22
8		1.354	1.434	1.305	1.36433	0.06512	0.02050	0.12
9		1.156	1.185	1.145	1.16200	0.02066	-0.18183	-1.09
10		1.210	1.184	1.276	1.22333	0.04743	-0.12050	-0.72
11		1.267	1.198	1.145	1.20333	0.06117	-0.14050	-0.84
12		1.314	1.311	1.298	1.30767	0.00850	-0.03617	-0.22
13		1.154	1.157	1.150	1.15367	0.00351	-0.19017	-1.14
14		1.401	1.386	1.330	1.37233	0.03742	0.02850	0.17
15		1.593	1.506	1.296	1.46500	0.15269	0.12117	0.72
16		1.547	1.511	1.462	1.50667	0.04267	0.16283	0.97
17		1.400	1.400	1.400	1.40000	0.00000	0.05617	0.34
18		1.113	1.068	0.901	1.02733	0.11170	-0.31650	-1.89
19		1.272	1.144	1.185	1.20033	0.06536	-0.14350	-0.86
20		1.565	1.733	1.673	1.65700	0.08514	0.31317	1.87
21		1.451	1.367	1.560	1.45933	0.09677	0.11550	0.69
22		1.402	1.376	1.416	1.39800	0.02030	0.05417	0.32
23		1.644	1.588	1.685	1.63900	0.04869	0.29517	1.76
24		1.335	1.272	1.236	1.28100	0.05011	-0.06283	-0.38
25		1.626	1.732	1.768	1.70867	0.07382	0.36483	2.18
26		1.349	1.326	1.407	1.36067	0.04174	0.01683	0.10
27		1.320	1.390	1.258	1.32267	0.06604	-0.02117	-0.13
28		1.426	1.310	1.342	1.35943	0.05989	0.01560	0.09

Average of Cell Averages

X-bar 1.344

Standard Deviation of Cell Averages

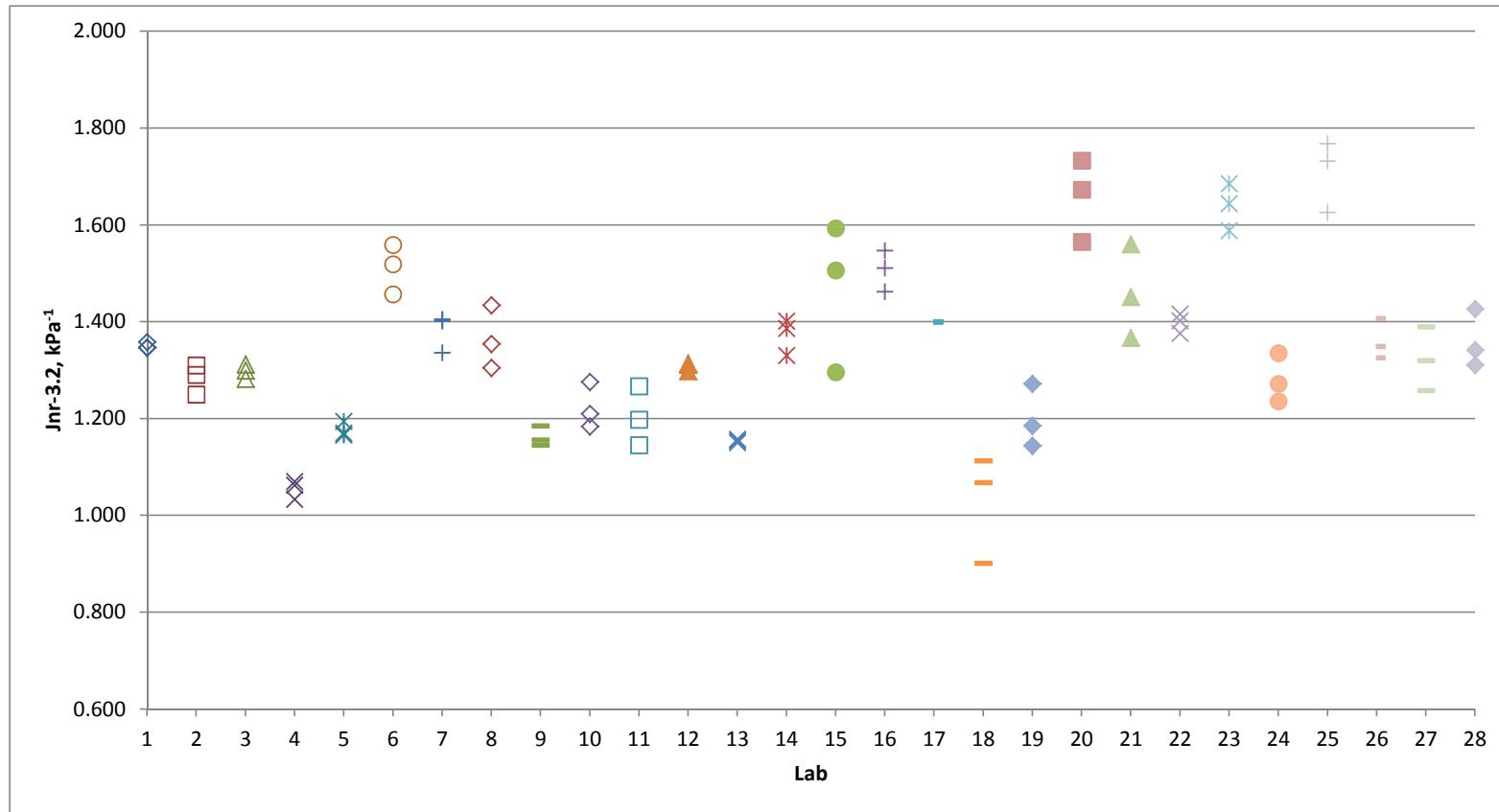
S_{X-bar} 0.167

Repeatability Standard Deviation

S_r 0.05887 0.174

Reproducibility Standard Deviation

S_R 0.174



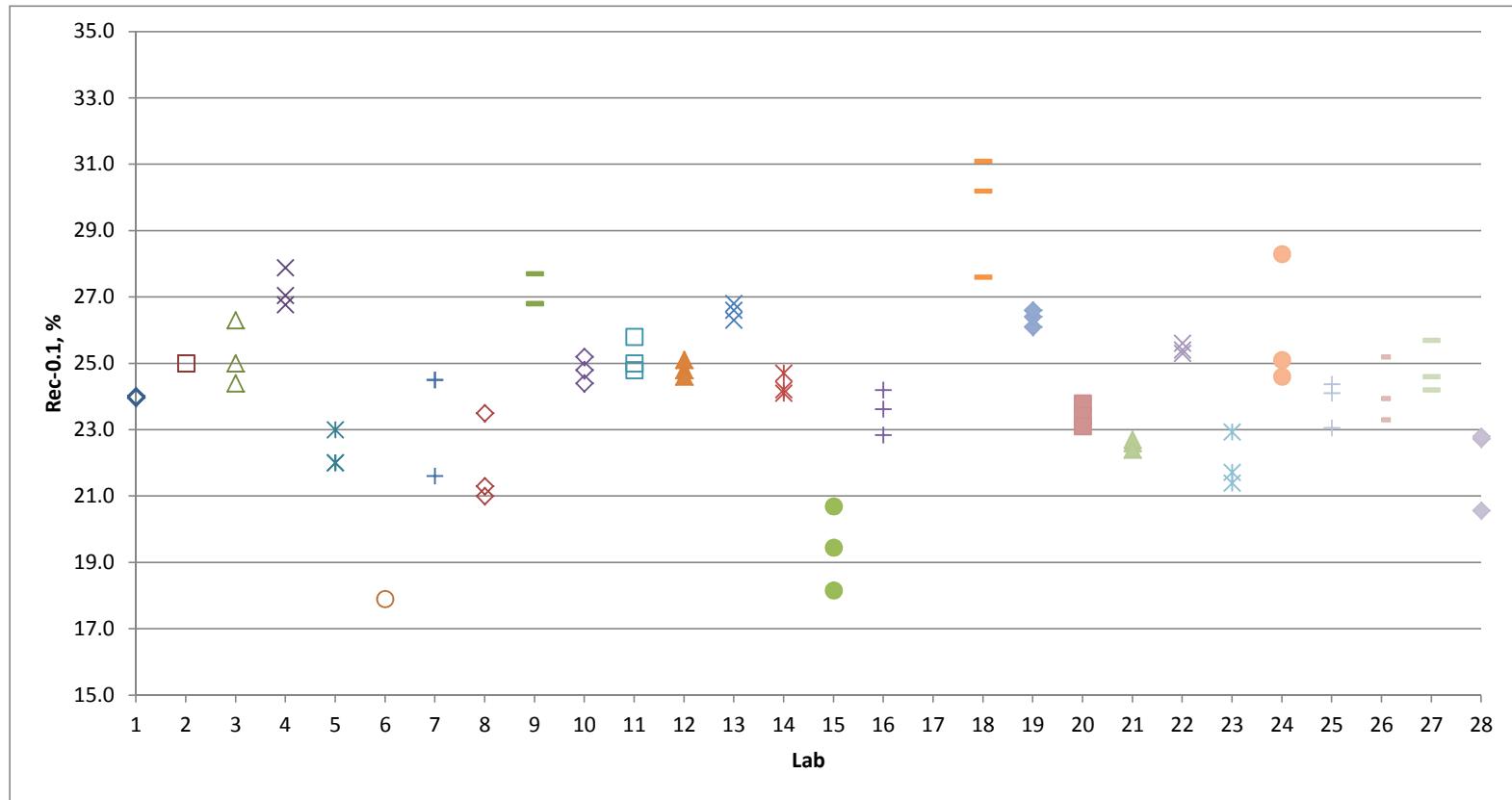
Binder C

PG 64-28 (58C)**Recovery (0.1 kPa)**

Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		24.0	24.0	24.0	23.980	0.035	-0.215	-0.09	0.04
2		25.0	25.0	25.0	25.000	0.000	0.805	0.33	0.00
3		24.4	26.3	25.0	25.233	0.971	1.039	0.43	1.08
4		27.0	26.8	27.9	27.227	0.583	3.032	1.26	0.65
5		22.0	23.0	22.0	22.333	0.577	-1.861	-0.77	0.64
6		17.9			17.900		-6.295	-2.61	0.00
7		21.6	24.5	24.5	23.533	1.674	-0.661	-0.27	1.86
8		21.3	21.0	23.5	21.933	1.365	-2.261	-0.94	1.51
9		26.8	27.7	26.8	27.100	0.520	2.905	1.21	0.58
10		24.8	25.2	24.4	24.800	0.400	0.605	0.25	0.44
11		24.8	25.0	25.8	25.200	0.529	1.005	0.42	0.59
12		24.8	24.6	25.1	24.833	0.252	0.639	0.27	0.28
13		26.6	26.8	26.3	26.567	0.252	2.372	0.98	0.28
14		24.1	24.2	24.7	24.333	0.321	0.139	0.06	0.36
15		18.2	19.5	20.7	19.433	1.265	-4.761	-1.98	1.40
16		22.8	23.6	24.2	23.550	0.678	-0.645	-0.27	0.75
17									
18		31.1	27.6	30.2	29.633	1.818	5.439	2.26	2.02
19		26.1	26.4	26.6	26.367	0.252	2.172	0.90	0.28
20		23.8	23.4	23.1	23.440	0.340	-0.755	-0.31	0.38
21		22.6	22.7	22.4	22.567	0.153	-1.628	-0.68	0.17
22		25.4	25.6	25.3	25.433	0.153	1.239	0.51	0.17
23		21.4	21.7	22.9	22.010	0.813	-2.185	-0.91	0.90
24		24.6	25.1	28.3	26.000	2.007	1.805	0.75	2.23
25		24.4	23.1	24.1	23.840	0.697	-0.355	-0.15	0.77
26		25.2	23.9	23.3	24.147	0.967	-0.048	-0.02	1.07
27		24.6	24.2	25.7	24.833	0.777	0.639	0.27	0.86
28		22.7	22.8	20.6	22.028	1.265	-2.167	-0.90	1.40

Average of Cell Averages X-bar 24.195

Standard Deviation of Cell Averages S_{X-bar} 2.409Repeatability Standard Deviation S_r 0.90147 2.519Reproducibility Standard Deviation S_R 2.519



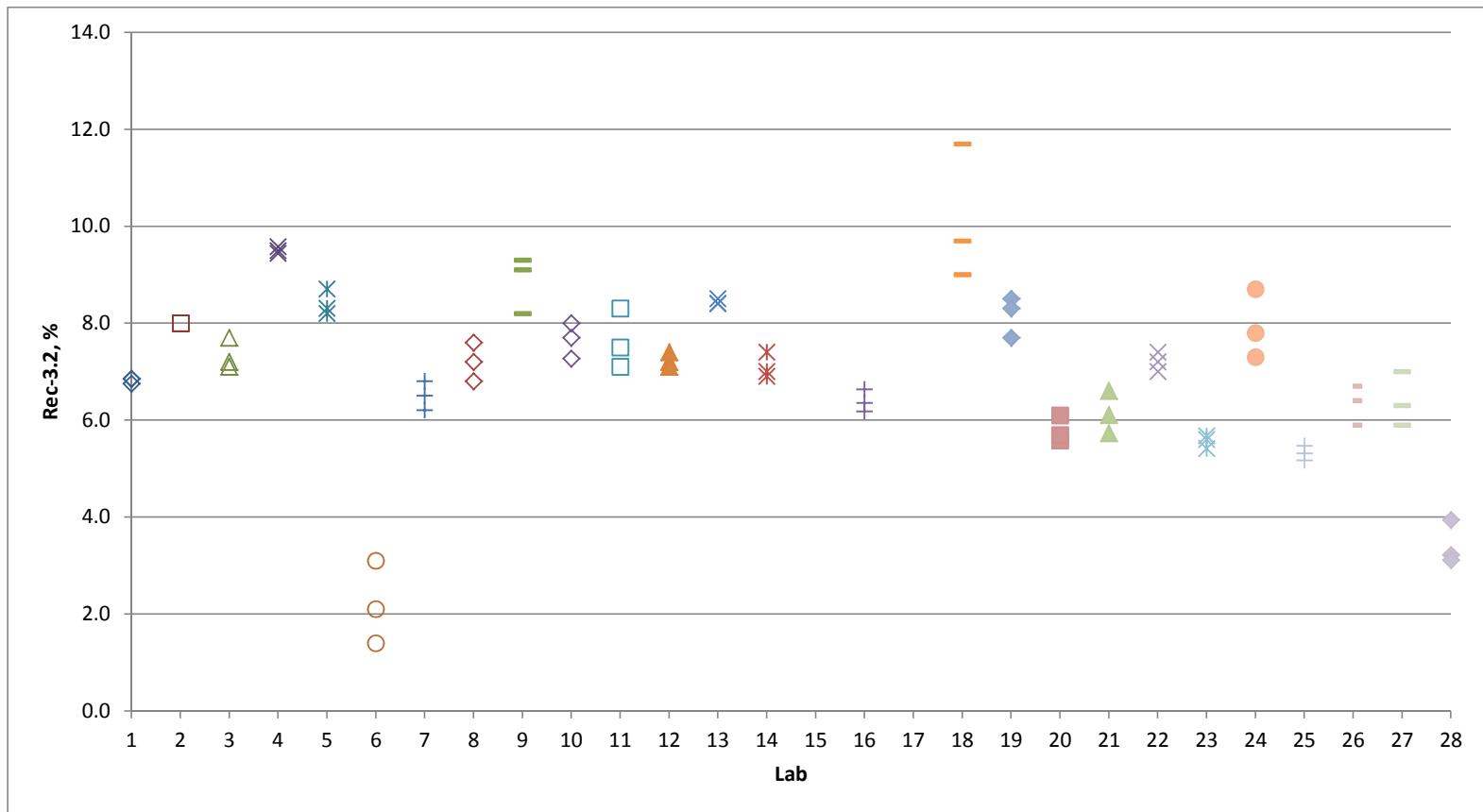
Binder C

PG 64-28 (58C)**Recovery (3.2 kPa)**

Lab No.	Lab Name	Results, x					h	k
		1	2	3	Average	s		
1		6.9	6.8	6.9	6.81667	0.05774	-0.17038	-0.10
2		8.0	8.0	8.0	8.00000	0.00000	1.01296	0.60
3		7.1	7.7	7.2	7.33333	0.32146	0.34629	0.20
4		9.4	9.6	9.5	9.50333	0.06730	2.51629	1.48
5		8.2	8.7	8.3	8.40000	0.26458	1.41296	0.83
6		2.1	3.1	1.4	2.20000	0.85440	-4.78704	-2.81
7		6.5	6.8	6.2	6.50000	0.30000	-0.48704	-0.29
8		7.2	6.8	7.6	7.20000	0.40000	0.21296	0.13
9		9.1	8.2	9.3	8.86667	0.58595	1.87962	1.11
10		7.7	8.0	7.3	7.65667	0.36692	0.66962	0.39
11		7.1	7.5	8.3	7.63333	0.61101	0.64629	0.38
12		7.2	7.1	7.4	7.23333	0.15275	0.24629	0.14
13		8.4	8.4	8.5	8.43333	0.05774	1.44629	0.85
14		6.9	7.0	7.4	7.10000	0.26458	0.11296	0.07
15								
16		6.2	6.4	6.6	6.38667	0.22723	-0.60038	0.48
17								
18		9.0	9.7	11.7	10.13333	1.40119	3.14629	1.85
19		7.7	8.5	8.3	8.16667	0.41633	1.17962	0.69
20		6.1	5.6	5.7	5.79067	0.27199	-1.19638	-0.70
21		6.1	6.6	5.7	6.14333	0.43662	-0.84371	-0.50
22		7.2	7.4	7.0	7.20000	0.20000	0.21296	0.13
23		5.4	5.7	5.6	5.56000	0.13454	-1.42704	-0.84
24		7.3	7.8	8.7	7.93333	0.70946	0.94629	0.56
25		5.5	5.3	5.2	5.31667	0.15005	-1.67038	-0.98
26		6.7	6.4	5.9	6.33333	0.40415	-0.65371	-0.38
27		6.3	5.9	7.0	6.40000	0.55678	-0.58704	-0.35
28		3.2	3.9	3.1	3.42250	0.45049	-3.56454	-2.10

Average of Cell Averages
 Standard Deviation of Cell Averages
 Repeatability Standard Deviation
 Reproducibility Standard Deviation

X-bar	6.987
S _{X-bar}	1.701
S _r	0.47322
S _R	1.744



Binder C

PG 64-28 (58C)

Jnr-Diff

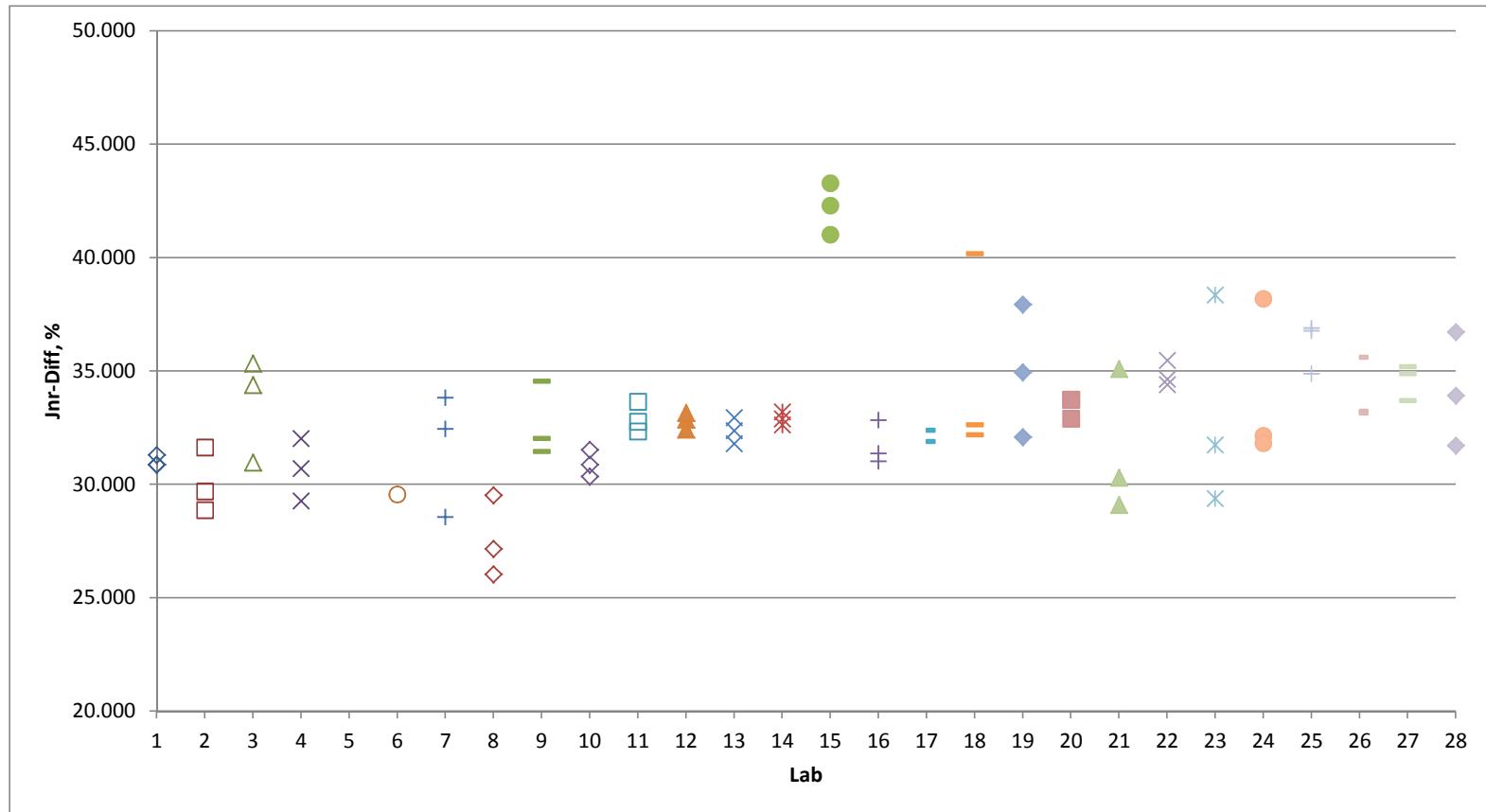
Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		30.880	31.300	30.880	31.02000	0.24249	-1.96853	-0.74	0.12
2		31.633	28.866	29.703	30.06720	1.41884	-2.92133	-1.10	0.69
3		30.965	35.329	34.389	33.56100	2.29680	0.57247	0.22	1.12
4		30.700	29.270	32.020	30.66333	1.37537	-2.32520	-0.88	0.67
5		29.560			29.56000		-3.42853	-1.29	0.00
6		28.559	32.451	33.832	31.61400	2.73433	-1.37453	-0.52	1.33
7		26.040	27.160	29.520	27.57333	1.77644	-5.41520	-2.04	0.86
9		32.040	34.560	31.460	32.68667	1.64807	-0.30186	-0.11	0.80
10		30.350	30.879	31.532	30.92033	0.59208	-2.06820	-0.78	0.29
11		32.772	32.337	33.655	32.92133	0.67157	-0.06720	-0.03	0.33
12		32.863	32.423	33.153	32.81300	0.36756	-0.17553	-0.07	0.18
13		32.366	32.947	31.800	32.37100	0.57352	-0.61753	-0.23	0.28
14		33.203	32.890	32.628	32.90700	0.28788	-0.08153	-0.03	0.14
15		41.020	43.290	42.300	42.20333	1.13808	9.21480	3.47	0.55
16		31.375	32.843	31.024	31.74733	0.96497	-1.24120	-0.47	0.47
17		31.900	32.400		32.15000	0.35355	-0.83853	-0.32	0.17
18		40.180	32.201	32.640	35.00700	4.48532	2.01847	0.76	2.18
19		37.934	32.090	34.941	34.98833	2.92229	1.99980	0.75	1.42
20		33.750	33.730	32.900	33.46000	0.48508	0.47147	0.18	0.24
21		30.300	29.100	35.100	31.50000	3.17490	-1.48853	-0.56	1.54
22		35.468	34.646	34.395	34.83633	0.56125	1.84780	0.70	0.27
23		29.382	31.745	38.352	33.15967	4.64932	0.17114	0.06	2.26
24		32.160	31.820	38.190	34.05667	3.58361	1.06814	0.40	1.74
25		36.900	34.880	36.780	36.18667	1.13320	3.19814	1.20	0.55
26		35.610	33.235	33.153	33.99933	1.39548	1.01080	0.38	0.68
27		33.700	34.900	35.200	34.60000	0.79373	1.61147	0.61	0.39
28		36.726	33.917	31.710	34.11744	2.51387	1.12891	0.43	1.22

Average of Cell Averages X-bar 32.989

Standard Deviation of Cell Averages S_{X-bar} 2.655

Repeatability Standard Deviation S_r 2.05889 3.142

Reproducibility Standard Deviation S_R 3.142



Binder C64
PG 64-28 (64C)

Jnr (0.1 kPa)

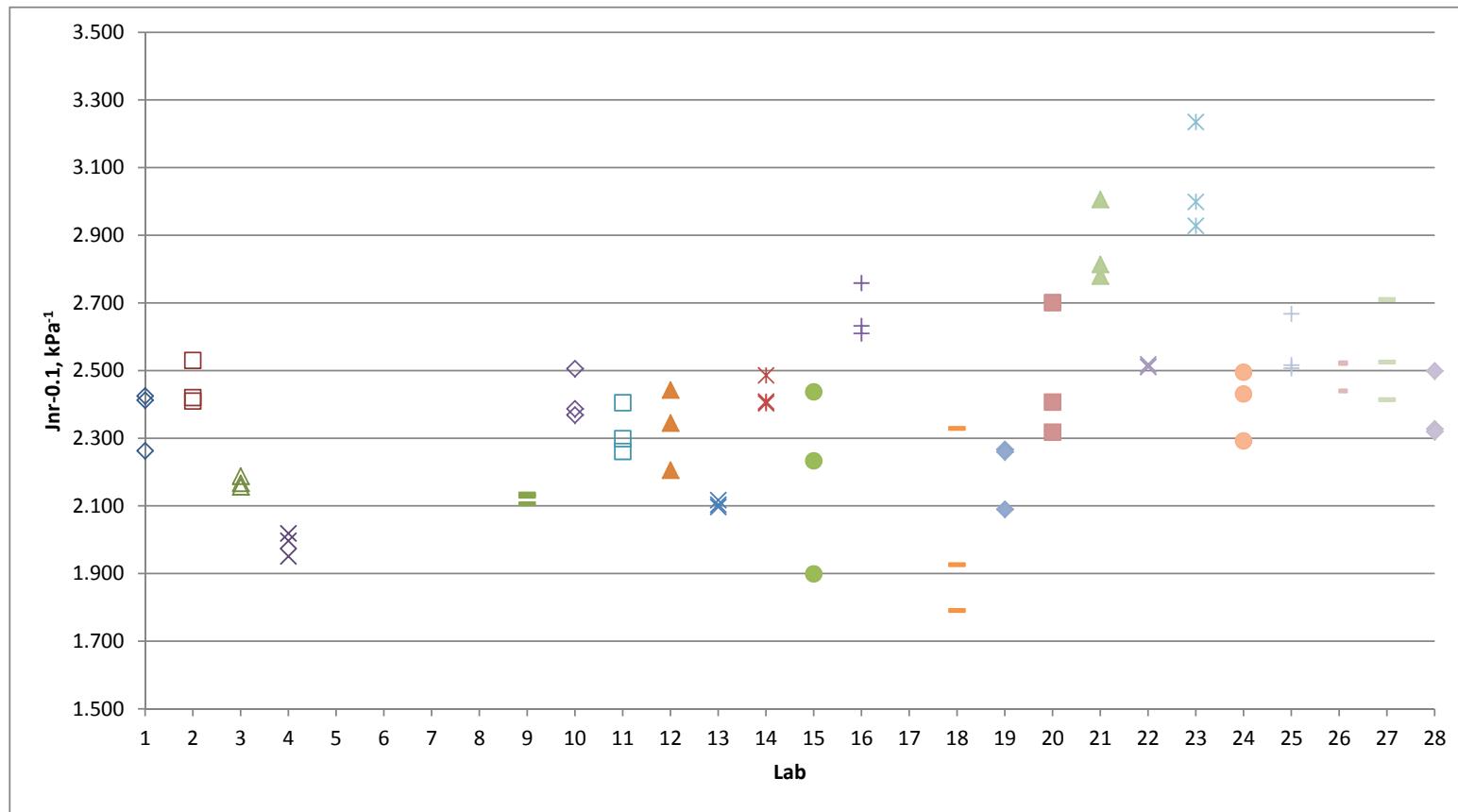
Lab No.	Lab Name	Results, x								
		1	2	3	Average	s	d	h	k	
1		2.263	2.425	2.412	2.36683	0.09015	-0.02877	-0.11	0.74	
2		2.420	2.410	2.530	2.45333	0.06658	0.05773	0.23	0.54	
3		2.167	2.157	2.188	2.17067	0.01582	-0.22494	-0.88	0.13	
4		2.019	1.997	1.951	1.98900	0.03470	-0.40661	-1.60	0.28	
5										
6										
7										
8										
9		2.129	2.135	2.106	2.12333	0.01531	-0.27227	-1.07	0.12	
10		2.506	2.387	2.369	2.42067	0.07445	0.02506	0.10	0.61	
11		2.261	2.299	2.405	2.32167	0.07463	-0.07394	-0.29	0.61	
12		2.443	2.345	2.206	2.33133	0.11909	-0.06427	-0.25	0.97	
13		2.097	2.117	2.104	2.10600	0.01015	-0.28961	-1.14	0.08	
14		2.408	2.486	2.403	2.43233	0.04654	0.03673	0.14	0.38	
15		2.233	1.899	2.437	2.18967	0.27161	-0.20594	-0.81	2.22	
16		2.610	2.759	2.632	2.66700	0.08043	0.27139	1.07	0.66	
17										
18		1.926	1.791	2.329	2.01533	0.27990	-0.38027	-1.49	2.28	
19		2.267	2.260	2.090	2.20567	0.10023	-0.18994	-0.75	0.82	
20		2.701	2.318	2.407	2.47533	0.20044	0.07973	0.31	1.64	
21		2.780	2.814	3.006	2.86667	0.12186	0.47106	1.85	0.99	
22		2.512	2.511	2.519	2.51400	0.00436	0.11839	0.47	0.04	
23		3.235	2.928	2.999	3.05400	0.16072	0.65839	2.59	1.31	
24		2.495	2.292	2.431	2.40600	0.10378	0.01039	0.04	0.85	
25		2.668	2.507	2.516	2.56367	0.09047	0.16806	0.66	0.74	
26		2.521	2.523	2.440	2.49467	0.04735	0.09906	0.39	0.39	
27		2.414	2.710	2.525	2.54967	0.14953	0.15406	0.61	1.22	
28		2.499	2.328	2.320	2.38213	0.10137	-0.01347	-0.05	0.83	

Average of Cell Averages X-bar 2.396

Standard Deviation of Cell Averages s_{X-bar} 0.254

Repeatability Standard Deviation s_r 0.12250 0.273

Reproducibility Standard Deviation s_R 0.273



Binder C64
PG 64-28 (64C)

Jnr (3.2 kPa)

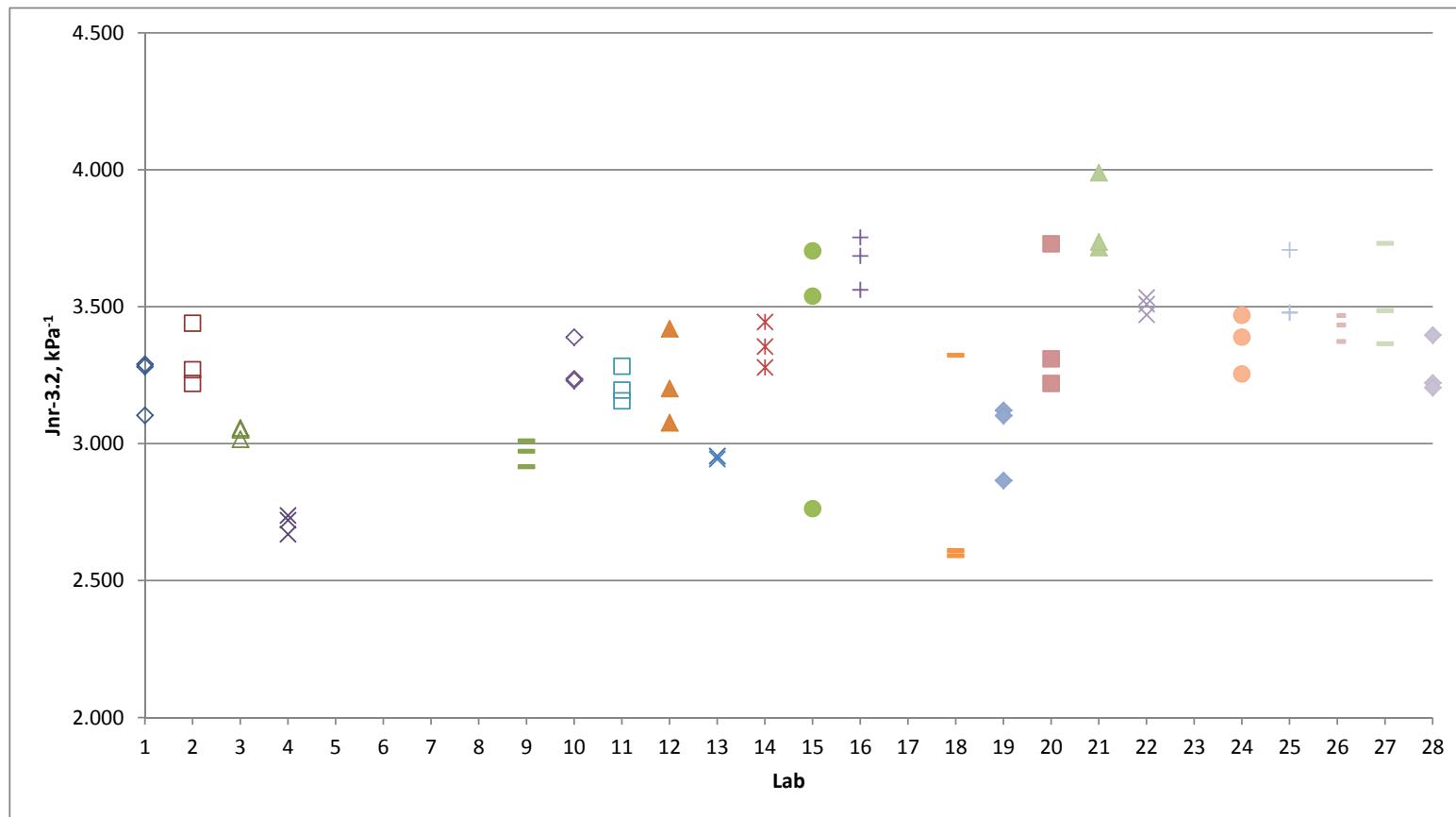
Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		3.104	3.291	3.282	3.22567	0.10545	-0.04992	-0.18	0.59
2		3.220	3.270	3.440	3.31000	0.11533	0.03442	0.13	0.64
3		3.058	3.017	3.051	3.04200	0.02193	-0.23358	-0.86	0.12
4		2.738	2.721	2.670	2.70967	0.03539	-0.56592	-2.09	0.20
5									
6									
7									
8									
9		2.973	3.011	2.916	2.96667	0.04782	-0.30892	-1.14	0.27
10		3.389	3.237	3.231	3.28567	0.08954	0.01008	0.04	0.50
11		3.157	3.196	3.283	3.21200	0.06451	-0.06358	-0.24	0.36
12		3.420	3.202	3.077	3.23300	0.17359	-0.04258	-0.16	0.97
13		2.944	2.955	2.954	2.95100	0.00608	-0.32458	-1.20	0.03
14		3.279	3.445	3.355	3.35967	0.08310	0.08408	0.31	0.46
15		3.539	2.763	3.704	3.33533	0.50247	0.05975	0.22	2.80
16		3.562	3.754	3.686	3.66733	0.09735	0.39175	1.45	0.54
17									
18		2.591	2.610	3.323	2.84133	0.41724	-0.43425	-1.61	2.32
19		3.122	3.103	2.866	3.03033	0.14263	-0.24525	-0.91	0.79
20		3.730	3.220	3.310	3.42000	0.27221	0.14442	0.53	1.52
21		3.717	3.737	3.990	3.81467	0.15217	0.53908	1.99	0.85
22		3.471	3.534	3.510	3.50500	0.03180	0.22942	0.85	0.18
23									
24		3.469	3.255	3.389	3.37100	0.10813	0.09542	0.35	0.60
25		3.708	3.480	3.478	3.55533	0.13222	0.27975	1.03	0.74
26		3.433	3.468	3.373	3.42467	0.04805	0.14908	0.55	0.27
27		3.365	3.732	3.486	3.52767	0.18701	0.25208	0.93	1.04
28		3.397	3.222	3.205	3.27483	0.10606	-0.00075	0.00	0.59

Average of Cell Averages X-bar 3.276

Standard Deviation of Cell Averages s_{X-bar} 0.270

Repeatability Standard Deviation s_r 0.17965 0.308

Reproducibility Standard Deviation s_R 0.308

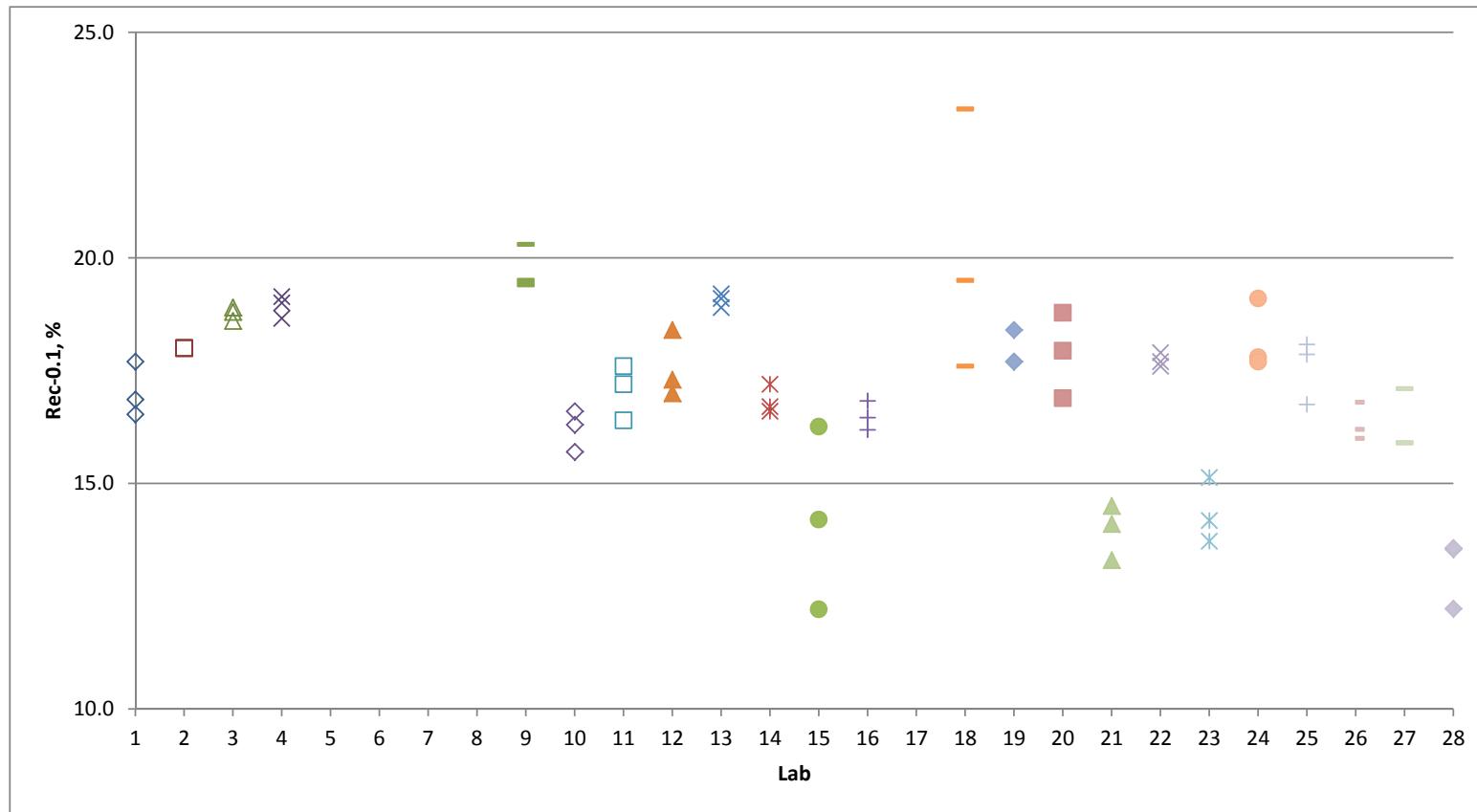


**Binder C64
PG 64-28 (64C)**

Recovery (0.1 kPa)

Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		17.7	16.5	16.9	17.030	0.603	-0.074	-0.04	0.67
2		18.0	18.0	18.0	18.000	0.000	0.896	0.49	0.00
3		18.9	18.8	18.6	18.767	0.153	1.662	0.90	0.17
4		19.0	18.7	19.1	18.933	0.247	1.829	0.99	0.27
5									
6									
7									
8									
9		19.5	20.3	19.4	19.733	0.493	2.629	1.43	0.54
10		15.7	16.3	16.6	16.200	0.458	-0.904	-0.49	0.51
11		17.6	17.2	16.4	17.067	0.611	-0.038	-0.02	0.67
12		17.3	17.0	18.4	17.567	0.737	0.462	0.25	0.81
13		19.2	18.9	19.1	19.067	0.153	1.962	1.07	0.17
14		16.7	16.6	17.2	16.833	0.321	-0.271	-0.15	0.35
15		12.2	14.2	16.3	14.223	2.025	-2.881	-1.57	2.23
16		16.8	16.2	16.5	16.493	0.321	-0.611	-0.33	0.35
17									
18		17.6	23.3	19.5	20.133	2.902	3.029	1.65	3.20
19		17.7	17.7	18.4	17.933	0.404	0.829	0.45	0.45
20		16.9	18.8	17.9	17.870	0.947	0.766	0.42	1.04
21		14.5	14.1	13.3	13.967	0.611	-3.138	-1.71	0.67
22		17.9	17.6	17.7	17.733	0.153	0.629	0.34	0.17
23		13.7	15.1	14.2	14.343	0.719	-2.761	-1.50	0.79
24		17.8	19.1	17.7	18.200	0.781	1.096	0.60	0.86
25		16.8	18.1	17.9	17.563	0.713	0.459	0.25	0.79
26		16.0	16.2	16.8	16.333	0.416	-0.771	-0.42	0.46
27		17.1	15.9	15.9	16.300	0.693	-0.804	-0.44	0.76
28		12.2	13.5	13.6	13.110	0.769	-3.994	-2.17	0.85

Average of Cell Averages
Standard Deviation of Cell Averages
Repeatability Standard Deviation
Reproducibility Standard Deviation

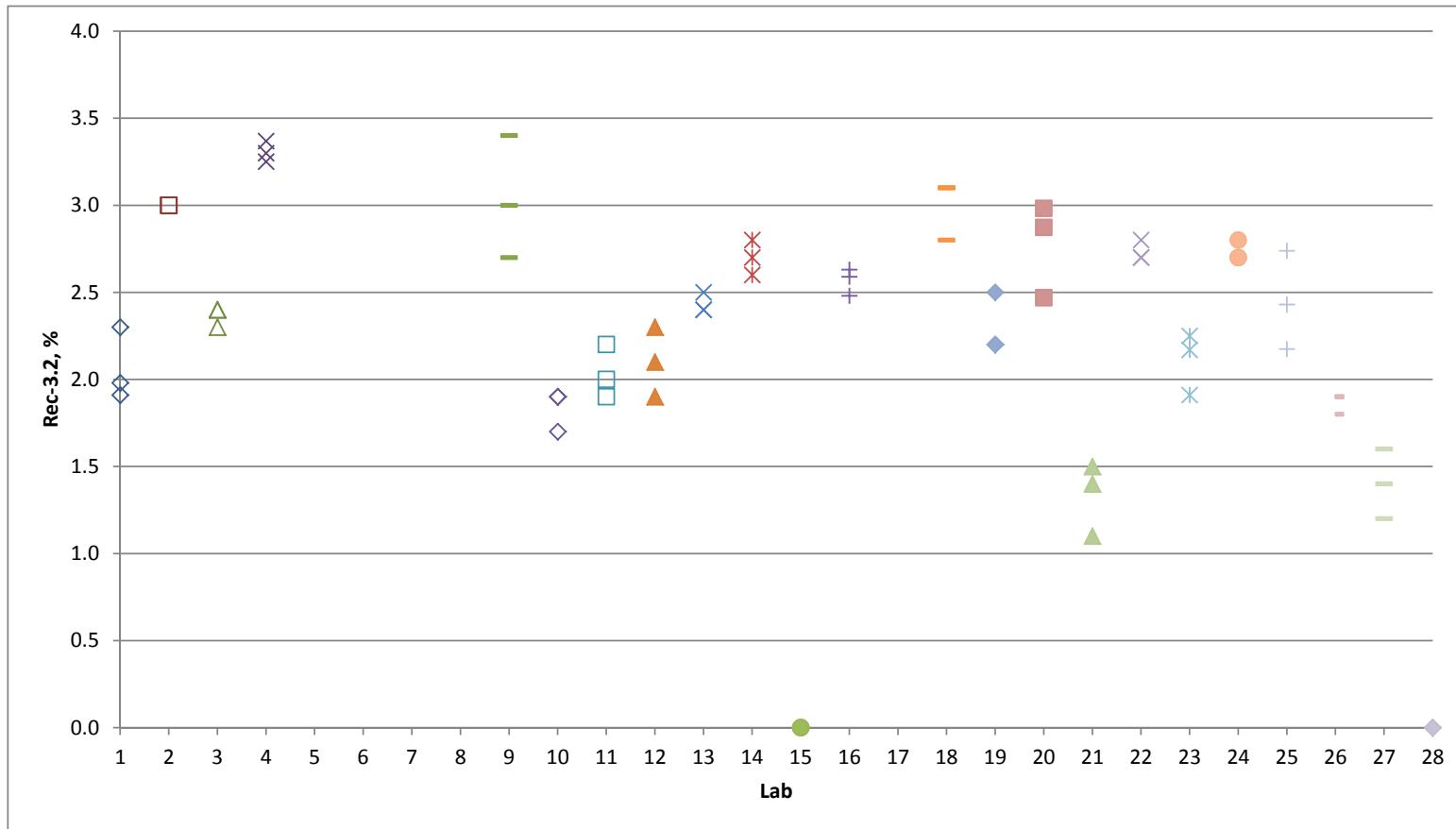


**Binder C64
PG 64-28 (64C)**

Recovery (3.2 kPa)

Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		2.3	1.9	2.0	2.06333	0.20793	-0.11648	-0.14	1.28
2		3.0	3.0	3.0	3.00000	0.00000	0.82019	0.96	0.00
3		2.3	2.4	2.4	2.36667	0.05774	0.18686	0.22	0.36
4		3.3	3.3	3.4	3.30667	0.05928	1.12686	1.32	0.36
5									
6									
7									
8									
9		3.4	2.7	3.0	3.03333	0.35119	0.85352	1.00	2.16
10		1.7	1.9	1.9	1.83333	0.11547	-0.34648	-0.41	0.71
11		1.9	2.2	2.0	2.03333	0.15275	-0.14648	-0.17	0.94
12		1.9	2.1	2.3	2.10000	0.20000	-0.07981	-0.09	1.23
13		2.5	2.4	2.4	2.43333	0.05774	0.25352	0.30	0.36
14		2.8	2.6	2.7	2.70000	0.10000	0.52019	0.61	0.62
15		0.0	0.0	0.0	0.00000	0.00000	-2.17981	-2.56	0.00
16		2.6	2.5	2.6	2.56667	0.07767	0.38686	0.45	0.48
17									
18		3.1	3.1	2.8	3.00000	0.17321	0.82019	0.96	1.07
19		2.2	2.2	2.5	2.30000	0.17321	0.12019	0.14	1.07
20		2.5	3.0	2.9	2.77467	0.27027	0.59486	0.70	1.66
21		1.5	1.4	1.1	1.33333	0.20817	-0.84648	-0.99	1.28
22		2.8	2.7	2.7	2.73333	0.05774	0.55352	0.65	0.36
23		1.9	2.3	2.2	2.11000	0.17776	-0.06981	-0.08	1.09
24		2.7	2.8	2.7	2.73333	0.05774	0.55352	0.65	0.36
25		2.2	2.7	2.4	2.44767	0.28291	0.26786	0.31	1.74
26		1.9	1.8	1.9	1.86667	0.05774	-0.31314	-0.37	0.36
27		1.6	1.2	1.4	1.40000	0.20000	-0.77981	-0.91	1.23
28		0.0	0.0	0.0	0.00000	0.00000	-2.17981	-2.56	0.00

Average of Cell Averages
Standard Deviation of Cell Averages
Repeatability Standard Deviation
Reproducibility Standard Deviation



Binder C64
PG 64-28 (64C)

Jnr-Diff

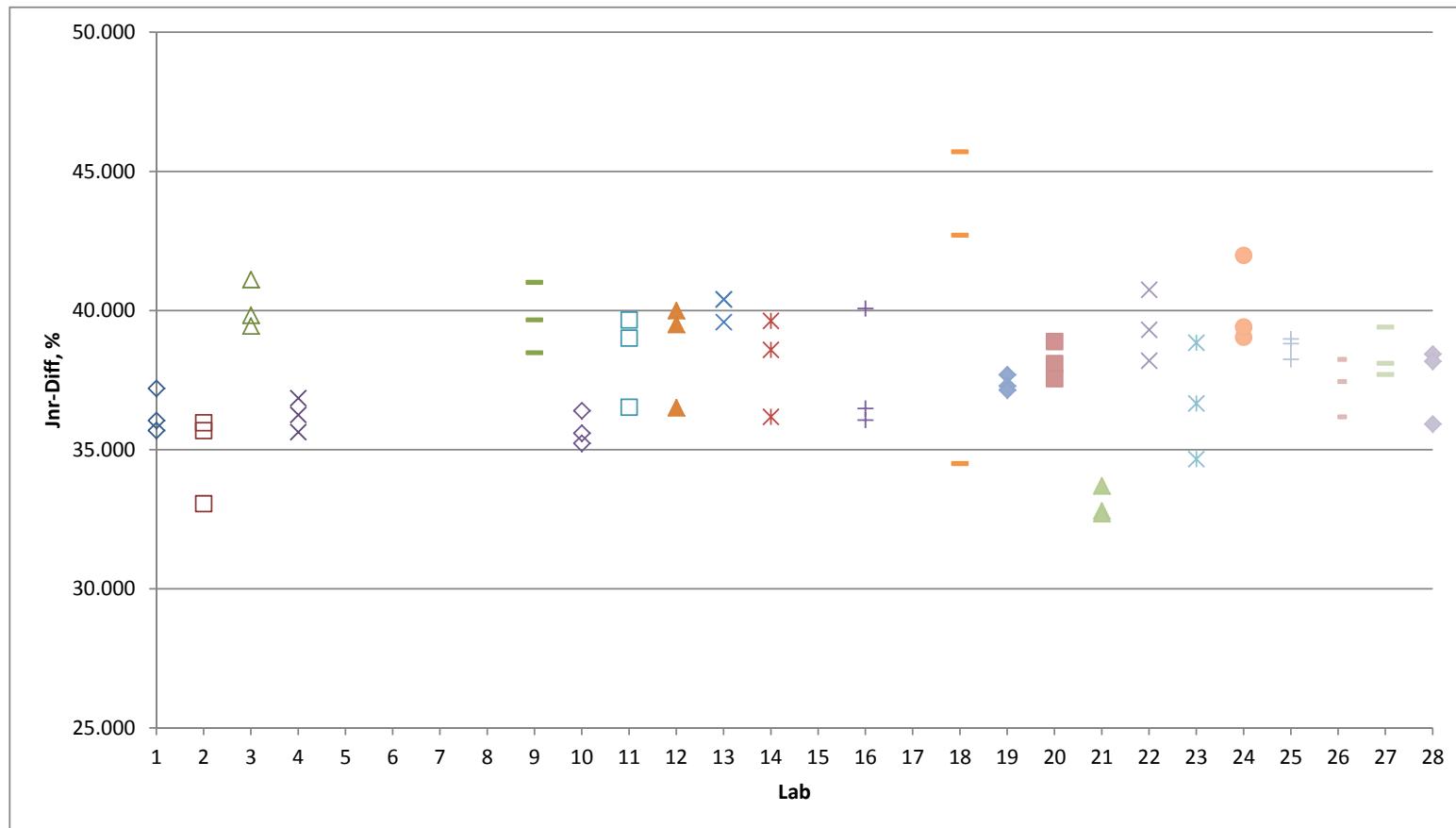
Lab No.	Lab Name	Results, x								
		1	2	3	Average	s	d	h	k	
1		37.200	35.690	36.050	36.31333	0.78869	-1.58090	-0.83	0.45	
2		33.058	35.685	35.968	34.90363	1.60477	-2.99061	-1.57	0.91	
3		41.115	39.832	39.445	40.13067	0.87414	2.23643	1.17	0.50	
4		35.630	36.250	36.850	36.24333	0.61003	-1.65090	-0.87	0.35	
5										
6										
7										
8										
9		39.660	41.010	38.480	39.71667	1.26595	1.82243	0.96	0.72	
10		35.232	35.593	36.402	35.74233	0.59912	-2.15190	-1.13	0.34	
11		39.657	39.006	36.527	38.39667	1.65157	0.50243	0.26	0.94	
12		39.998	36.510	39.500	38.66933	1.88654	0.77510	0.41	1.07	
13		40.397	39.587	40.406	40.13000	0.47027	2.23577	1.17	0.27	
14		36.181	38.590	39.629	38.13333	1.76878	0.23910	0.13	1.01	
15										
16		36.480	36.066	40.072	37.53933	2.20310	-0.35490	-0.19	1.26	
17										
18		34.500	45.705	42.709	40.97133	5.80109	3.07710	1.61	3.31	
19		37.695	37.289	37.144	37.37600	0.28562	-0.51823	-0.27	0.16	
20		38.090	38.880	37.550	38.17333	0.66890	0.27910	0.15	0.38	
21		33.700	32.800	32.700	33.06667	0.55076	-4.82757	-2.53	0.31	
22		38.199	40.746	39.313	39.41933	1.27683	1.52510	0.80	0.73	
23		38.845	36.662	34.659	36.72200	2.09364	-1.17223	-0.61	1.19	
24		39.040	41.980	39.410	40.14333	1.60132	2.24910	1.18	0.91	
25		38.980	38.810	38.250	38.68000	0.38197	0.78577	0.41	0.22	
26		36.178	37.444	38.245	37.28900	1.04218	-0.60523	-0.32	0.59	
27		39.400	37.700	38.100	38.40000	0.88882	0.50577	0.27	0.51	
28		35.925	38.437	38.178	37.51349	1.38170	-0.38074	-0.20	0.79	

Average of Cell Averages X-bar 37.894

Standard Deviation of Cell Averages s_{X-bar} 1.908

Repeatability Standard Deviation s_r 1.75524 2.386

Reproducibility Standard Deviation s_R 2.386



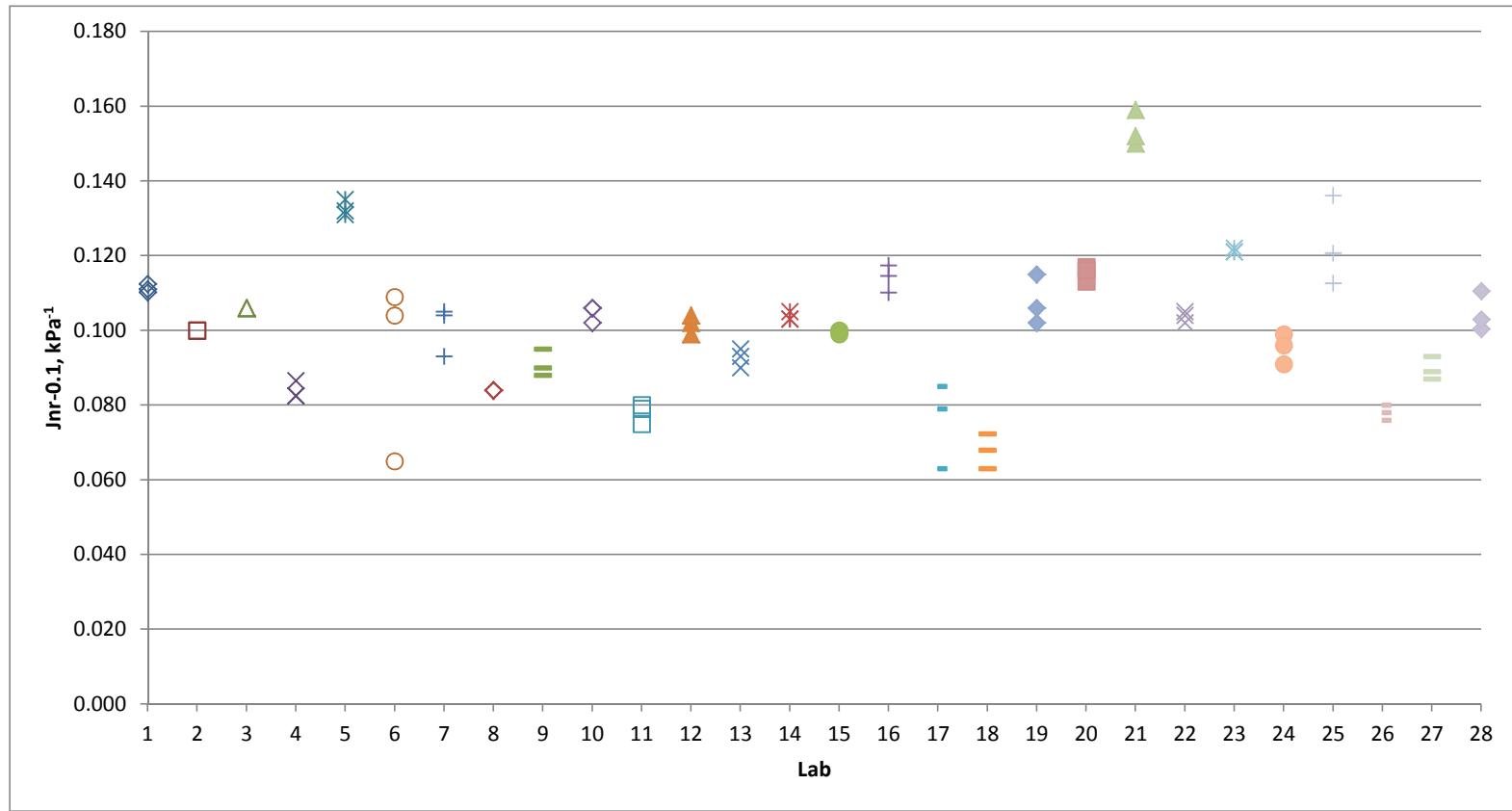
Binder D

PG 70-28 (58C)**Jnr (0.1 kPa)**

Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		0.110	0.111	0.112	0.11120	0.00111	0.01005	0.55	0.18
2		0.100	0.100	0.100	0.10000	0.00000	-0.00115	-0.06	0.00
3		0.106	0.106	0.106	0.10600	0.00000	0.00485	0.26	0.00
4		0.082	0.087	0.082	0.08382	0.00232	-0.01733	-0.95	0.37
5		0.131	0.135	0.132	0.13267	0.00208	0.03151	1.72	0.33
6		0.104	0.109	0.065	0.09267	0.02409	-0.00849	-0.46	3.82
7		0.105	0.104	0.093	0.10067	0.00666	-0.00049	-0.03	1.06
8		0.084	0.084	0.084	0.08400	0.00000	-0.01715	-0.94	0.00
9		0.088	0.090	0.095	0.09100	0.00361	-0.01015	-0.55	0.57
10		0.106	0.106	0.102	0.10467	0.00231	0.00351	0.19	0.37
11		0.075	0.079	0.080	0.07800	0.00265	-0.02315	-1.26	0.42
12		0.102	0.099	0.104	0.10167	0.00252	0.00051	0.03	0.40
13		0.093	0.090	0.095	0.09267	0.00252	-0.00849	-0.46	0.40
14		0.105	0.103	0.103	0.10367	0.00115	0.00251	0.14	0.18
15		0.100	0.100	0.099	0.09967	0.00058	-0.00149	-0.08	0.09
16		0.110	0.117	0.115	0.11403	0.00368	0.01288	0.70	0.58
17		0.085	0.063	0.079	0.07567	0.01137	-0.02549	-1.39	1.80
18		0.068	0.063	0.072	0.06777	0.00465	-0.03339	-1.82	0.74
19		0.106	0.102	0.115	0.10767	0.00666	0.00651	0.36	1.06
20		0.117	0.113	0.116	0.11540	0.00204	0.01425	0.78	0.32
21		0.150	0.152	0.159	0.15367	0.00473	0.05251	2.87	0.75
22		0.105	0.104	0.102	0.10367	0.00153	0.00251	0.14	0.24
23		0.122	0.121	0.121	0.12133	0.00058	0.02018	1.10	0.09
24		0.099	0.091	0.096	0.09533	0.00404	-0.00582	-0.32	0.64
25		0.121	0.113	0.136	0.12313	0.01194	0.02198	1.20	1.89
26		0.078	0.076	0.080	0.07800	0.00200	-0.02315	-1.26	0.32
27		0.087	0.093	0.089	0.08967	0.00306	-0.01149	-0.63	0.48
28		0.100	0.111	0.103	0.10461	0.00531	0.00346	0.19	0.84

Average of Cell Averages X-bar 0.101

Standard Deviation of Cell Averages S_{X-bar} 0.018Repeatability Standard Deviation S_r 0.00631 0.019Reproducibility Standard Deviation S_R 0.019



Binder D

PG 70-28 (58C)**Jnr (3.2 kPa)**

Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		0.115	0.116	0.117	0.11580	0.00105	0.01126	0.71	0.22
2		0.100	0.100	0.100	0.10000	0.00000	-0.00454	-0.29	0.00
3		0.111	0.111	0.110	0.11067	0.00058	0.00612	0.39	0.12
4		0.085	0.087	0.083	0.08502	0.00241	-0.01952	-1.24	0.50
5		0.127	0.132	0.133	0.13067	0.00321	0.02612	1.66	0.67
6		0.106	0.114	0.124	0.11467	0.00902	0.01012	0.64	1.88
7		0.108	0.103	0.096	0.10233	0.00603	-0.00221	-0.14	1.25
8		0.084	0.084	0.087	0.08500	0.00173	-0.01954	-1.24	0.36
9		0.090	0.092	0.097	0.09300	0.00361	-0.01154	-0.73	0.75
10		0.111	0.110	0.105	0.10867	0.00321	0.00412	0.26	0.67
11		0.085	0.089	0.083	0.08567	0.00306	-0.01888	-1.20	0.64
12		0.106	0.103	0.108	0.10567	0.00252	0.00112	0.07	0.52
13		0.094	0.090	0.096	0.09333	0.00306	-0.01121	-0.71	0.64
14		0.108	0.108	0.108	0.10800	0.00000	0.00346	0.22	0.00
15		0.118	0.116	0.115	0.11633	0.00153	0.01179	0.75	0.32
16		0.116	0.122	0.121	0.11947	0.00347	0.01492	0.95	0.72
17		0.093	0.066	0.088	0.08233	0.01436	-0.02221	-1.41	2.99
18		0.074	0.063	0.073	0.07007	0.00605	-0.03448	-2.19	1.26
19		0.111	0.106	0.120	0.11233	0.00709	0.00779	0.49	1.48
20		0.128	0.118	0.121	0.12247	0.00515	0.01792	1.14	1.07
21									
22		0.109	0.107	0.104	0.10667	0.00252	0.00212	0.13	0.52
23		0.130	0.126	0.131	0.12900	0.00265	0.02446	1.55	0.55
24		0.102	0.095	0.098	0.09833	0.00351	-0.00621	-0.39	0.73
25		0.133	0.125	0.138	0.13203	0.00634	0.02749	1.74	1.32
26		0.089	0.092	0.087	0.08933	0.00252	-0.01521	-0.97	0.52
27		0.099	0.101	0.100	0.10000	0.00100	-0.00454	-0.29	0.21
28		0.101	0.112	0.105	0.10584	0.00552	0.00130	0.08	1.15

Average of Cell Averages

X-bar 0.105

Standard Deviation of Cell Averages

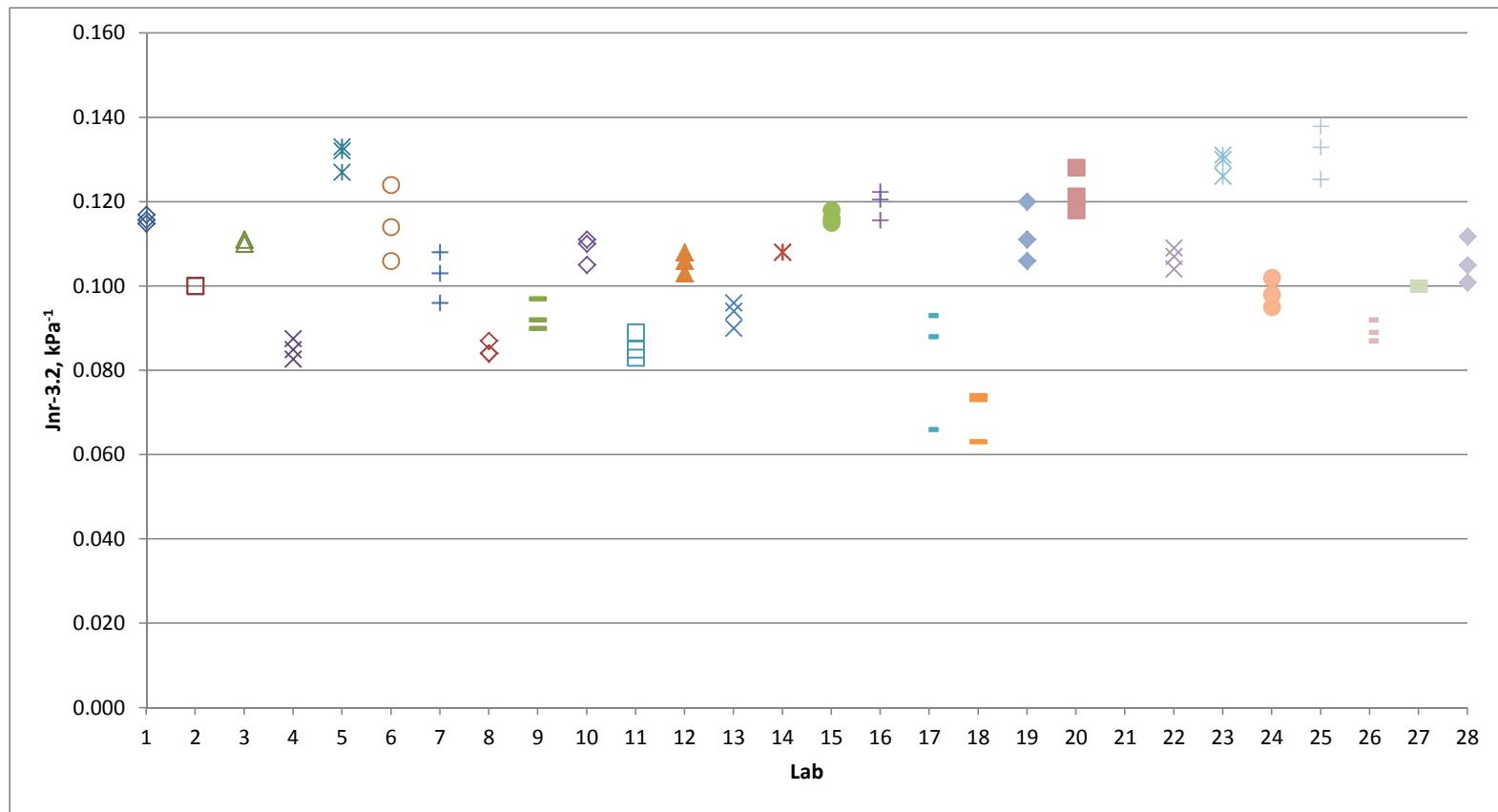
S_{X-bar} 0.016

Repeatability Standard Deviation

S_r 0.00481 0.016

Reproducibility Standard Deviation

S_R 0.016



Binder D

PG 70-28 (58C)

Recovery (0.1 kPa)

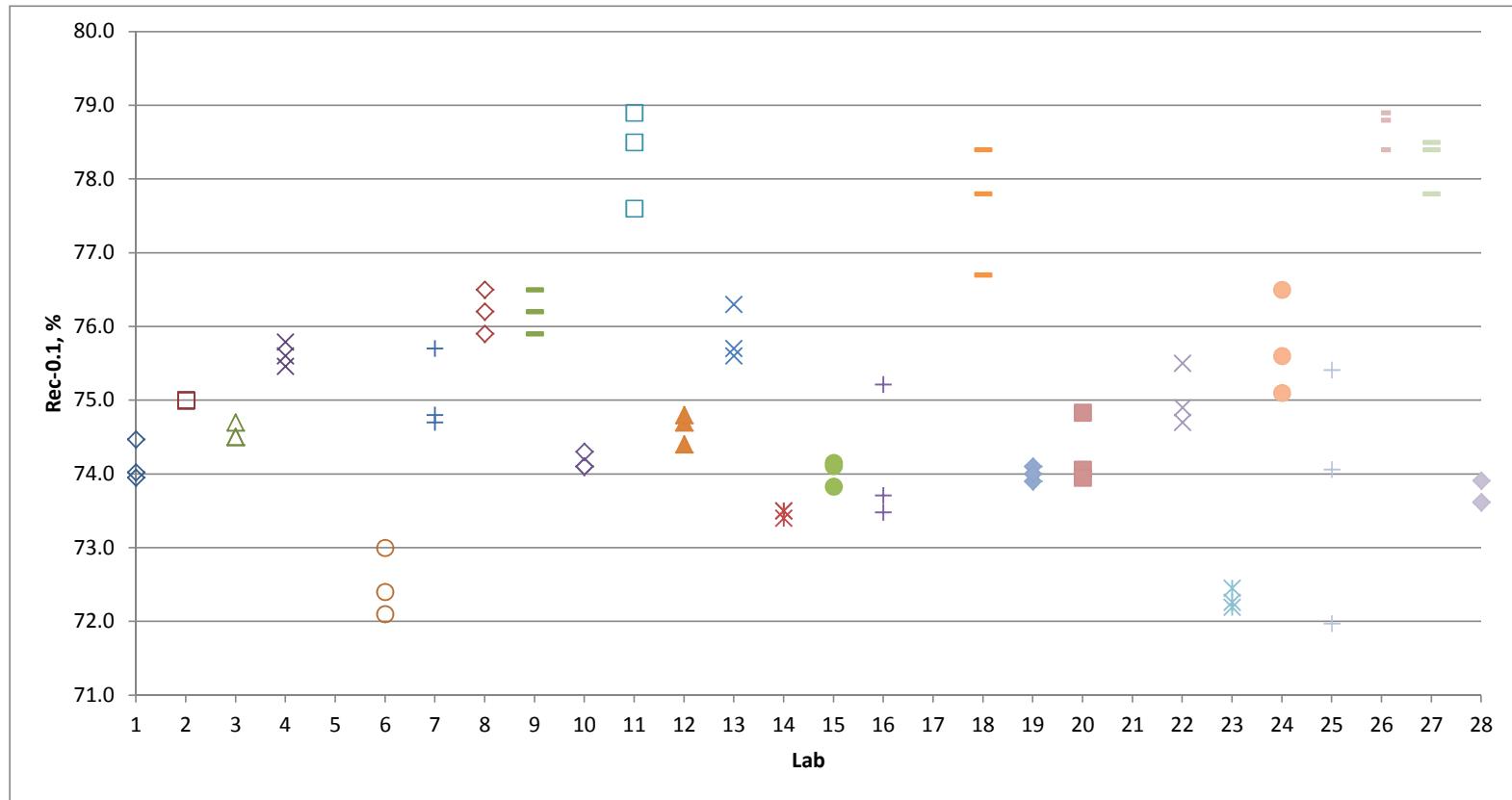
Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		74.0	74.0	74.5	74.147	0.282	-0.948	-0.55	0.52
2		75.0	75.0	75.0	75.000	0.000	-0.095	-0.06	0.00
3		74.5	74.5	74.7	74.567	0.115	-0.528	-0.31	0.21
4		75.8	75.6	75.5	75.617	0.166	0.522	0.30	0.31
5									
6		72.4	73.0	72.1	72.500	0.458	-2.595	-1.51	0.85
7		75.7	74.7	74.8	75.067	0.551	-0.028	-0.02	1.02
8		75.9	76.2	76.5	76.200	0.300	1.105	0.65	0.56
9		76.5	75.9	76.2	76.200	0.300	1.105	0.65	0.56
10		74.1	74.1	74.3	74.167	0.115	-0.928	-0.54	0.21
11		78.9	78.5	77.6	78.333	0.666	3.239	1.89	1.23
12		74.7	74.8	74.4	74.633	0.208	-0.461	-0.27	0.39
13		75.6	76.3	75.7	75.867	0.379	0.772	0.45	0.70
14		73.5	73.5	73.4	73.467	0.058	-1.628	-0.95	0.11
15		74.2	73.8	74.1	74.030	0.174	-1.065	-0.62	0.32
16		73.5	75.2	73.7	74.133	0.939	-0.961	-0.56	1.74
17									
18		78.4	77.8	76.7	77.633	0.862	2.539	1.48	1.60
19		73.9	74.1	74.0	74.000	0.100	-1.095	-0.64	0.19
20		74.1	74.8	74.0	74.280	0.479	-0.815	-0.48	0.89
21									
22		74.7	74.9	75.5	75.033	0.416	-0.061	-0.04	0.77
23		72.3	72.2	72.5	72.300	0.135	-2.795	-1.63	0.25
24		75.1	76.5	75.6	75.733	0.709	0.639	0.37	1.31
25		74.1	75.4	72.0	73.813	1.733	-1.281	-0.75	3.21
26		78.8	78.9	78.4	78.700	0.265	3.605	2.10	0.49
27		78.5	77.8	78.4	78.233	0.379	3.139	1.83	0.70
28		73.6	73.6	73.9	73.714	0.170	-1.380	-0.81	0.31

Average of Cell Averages X-bar 75.095

Standard Deviation of Cell Averages S_{X-bar} 1.713

Repeatability Standard Deviation S_r 0.54028 1.769

Reproducibility Standard Deviation S_R 1.769



Binder D

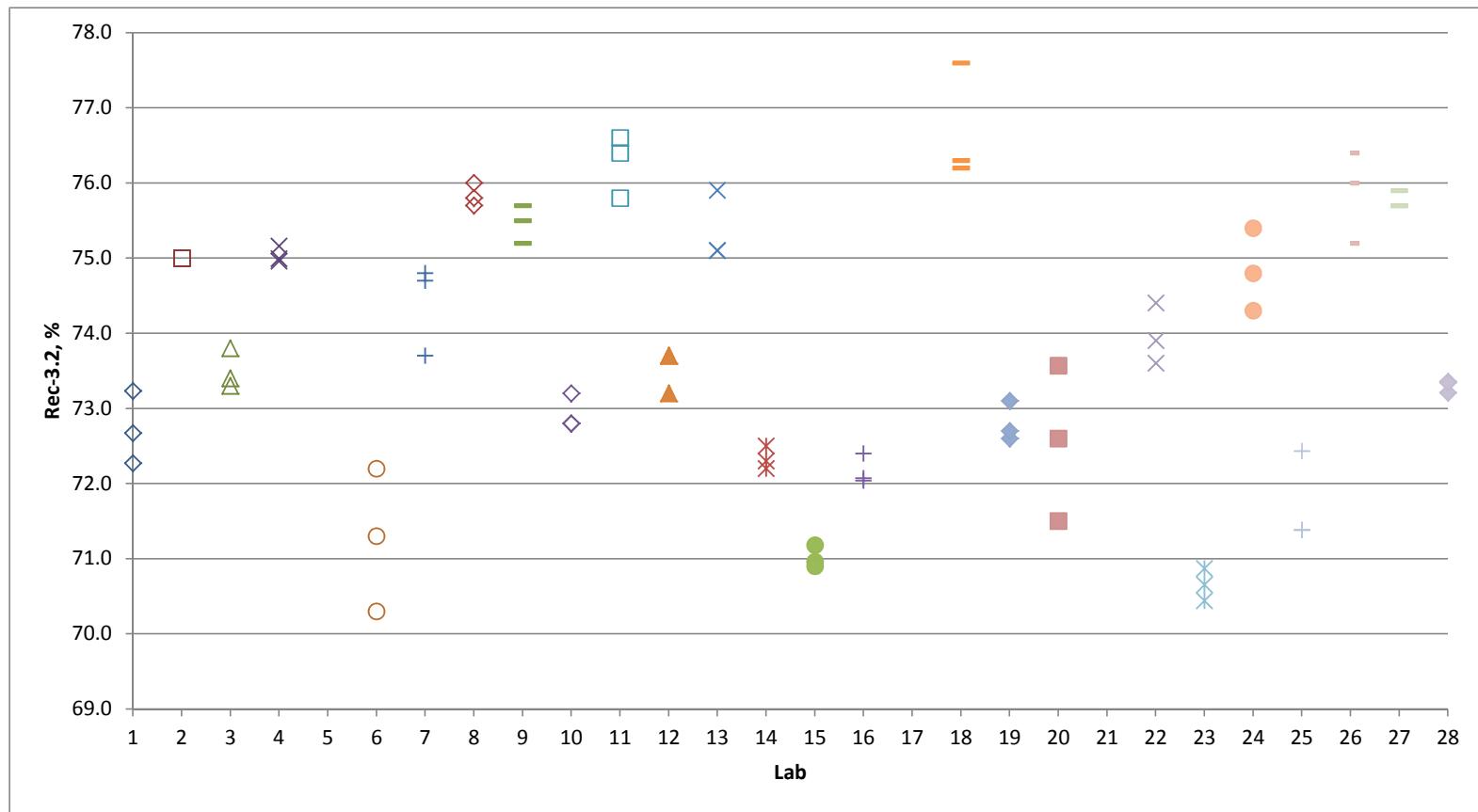
PG 70-28 (58C)

Recovery (3.2 kPa)

Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		72.7	72.3	73.2	72.72333	0.48222	-1.07742	-0.61	1.05
2		75.0	75.0	75.0	75.00000	0.00000	1.19924	0.68	0.00
3		73.3	73.4	73.8	73.50000	0.26458	-0.30076	-0.17	0.57
4		75.0	75.2	75.0	75.03667	0.10786	1.23591	0.70	0.23
5									
6		72.2	71.3	70.3	71.26667	0.95044	-2.53409	-1.44	2.06
7		74.8	74.7	73.7	74.40000	0.60828	0.59924	0.34	1.32
8		75.8	76.0	75.7	75.83333	0.15275	2.03258	1.15	0.33
9		75.7	75.2	75.5	75.46667	0.25166	1.66591	0.95	0.55
10		72.8	72.8	73.2	72.93333	0.23094	-0.86742	-0.49	0.50
11		76.4	75.8	76.6	76.26667	0.41633	2.46591	1.40	0.90
12		73.7	73.7	73.2	73.53333	0.28868	-0.26742	-0.15	0.63
13		75.1	75.9	75.1	75.36667	0.46188	1.56591	0.89	1.00
14		72.2	72.3	72.5	72.33333	0.15275	-1.46742	-0.83	0.33
15		71.0	70.9	71.2	71.01333	0.14742	-2.78742	-1.58	0.32
16		72.4	72.0	72.1	72.17000	0.19975	-1.63076	-0.93	0.43
17									
18		76.3	77.6	76.2	76.70000	0.78102	2.89924	1.65	1.69
19		72.6	73.1	72.7	72.80000	0.26458	-1.00076	-0.57	0.57
20		71.5	73.6	72.6	72.55667	1.03568	-1.24409	-0.71	2.25
21									
22		73.6	73.9	74.4	73.96667	0.40415	0.16591	0.09	0.88
23		70.7	70.9	70.4	70.65333	0.21502	-3.14742	-1.79	0.47
24		74.3	75.4	74.8	74.83333	0.55076	1.03258	0.59	1.20
25		71.4	72.4	71.4	71.73000	0.60622	-2.07076	-1.18	1.32
26		76.0	75.2	76.4	75.86667	0.61101	2.06591	1.17	1.33
27		75.7	75.9	75.7	75.76667	0.11547	1.96591	1.12	0.25
28		73.4	73.2	73.3	73.30223	0.08071	-0.49853	-0.28	0.18

Average of Cell Averages
 Standard Deviation of Cell Averages
 Repeatability Standard Deviation
 Reproducibility Standard Deviation

X-bar	73.801
s _{X-bar}	1.761
s _r	0.46081
s _R	1.801



Binder D

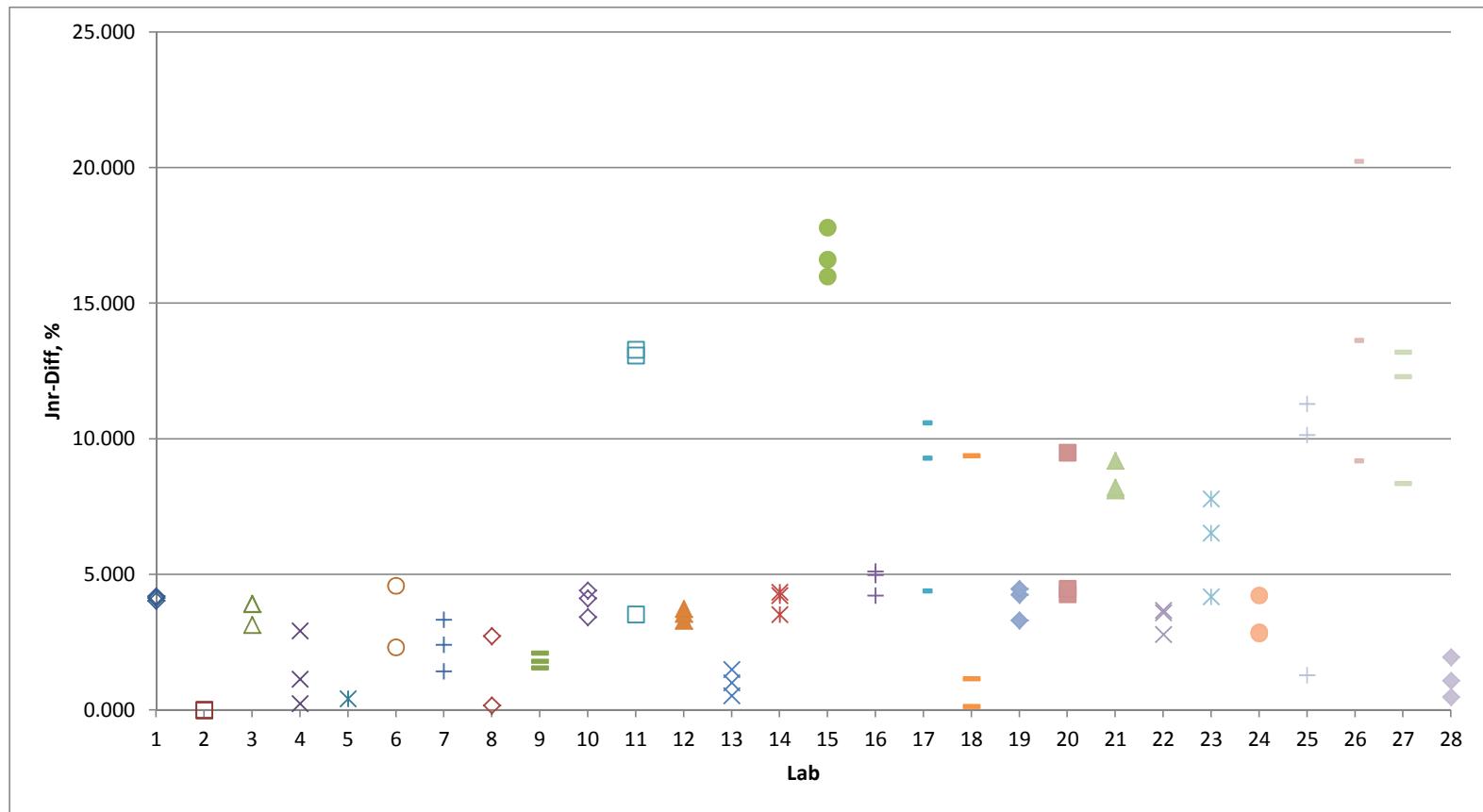
PG 70-28 (58C)

Jnr-Diff

Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		4.130	4.200	4.030	4.12000	0.08544	-0.89081	-0.22	0.04
2		0.000	0.000	0.000	0.00000	0.00000	-5.01081	-1.22	0.00
3		3.926	3.910	3.144	3.66000	0.44694	-1.35081	-0.33	0.18
4		2.921	1.143	0.235	1.43293	1.36637	-3.57788	-0.87	0.56
5				0.420	0.42000		-4.59081	-1.11	0.00
6		2.319	4.586		3.45250	1.60301	-1.55831	-0.38	0.66
7		2.403	1.428	3.326	2.38567	0.94912	-2.62515	-0.64	0.39
8			0.176	2.727	1.45150	1.80383	-3.55931	-0.86	0.74
9		2.111	1.810	1.560	1.82700	0.27589	-3.18381	-0.77	0.11
10		4.117	4.411	3.434	3.98733	0.50124	-1.02348	-0.25	0.21
11		13.075	13.286	3.529	9.96333	5.57329	4.95252	1.20	2.29
12		3.297	3.559	3.727	3.52767	0.21671	-1.48315	-0.36	0.09
13		1.007	0.525	1.491	1.00767	0.48300	-4.00315	-0.97	0.20
14		3.520	4.344	4.218	4.02733	0.44386	-0.98348	-0.24	0.18
15		17.800	16.000	16.620	16.80667	0.91440	11.79585	2.86	0.38
16		4.980	4.223	5.107	4.77000	0.47795	-0.24081	-0.06	0.20
17		9.300	4.400	10.600	8.10000	3.26956	3.08919	0.75	1.34
18		9.386	0.141	1.158	3.56167	5.06959	-1.44915	-0.35	2.08
19		4.253	3.312	4.469	4.01133	0.61519	-0.99948	-0.24	0.25
20		9.491	4.276	4.482	6.08300	2.95321	1.07219	0.26	1.21
21		8.100	8.200	9.200	8.50000	0.60828	3.48919	0.85	0.25
22		3.681	3.582	2.788	3.35033	0.48950	-1.66048	-0.40	0.20
23		6.521	4.176	7.779	6.15867	1.82862	1.14785	0.28	0.75
24		2.874	4.235	2.825	3.31133	0.80029	-1.69948	-0.41	0.33
25		10.140	11.290	1.283	7.57100	5.47584	2.56019	0.62	2.25
26		13.631	20.241	9.195	14.35567	5.55854	9.34485	2.27	2.28
27		13.200	8.360	12.300	11.28667	2.57421	6.27585	1.52	1.06
28		0.482	1.086	1.952	1.17351	0.73909	-3.83730	-0.93	0.30

Average of Cell Averages
 Standard Deviation of Cell Averages
 Repeatability Standard Deviation
 Reproducibility Standard Deviation

X-bar	5.011
S _{X-bar}	4.121
S _r	2.43332
S _R	4.575



Binder D64
PG 70-28 (64C)

Jnr (0.1 kPa)

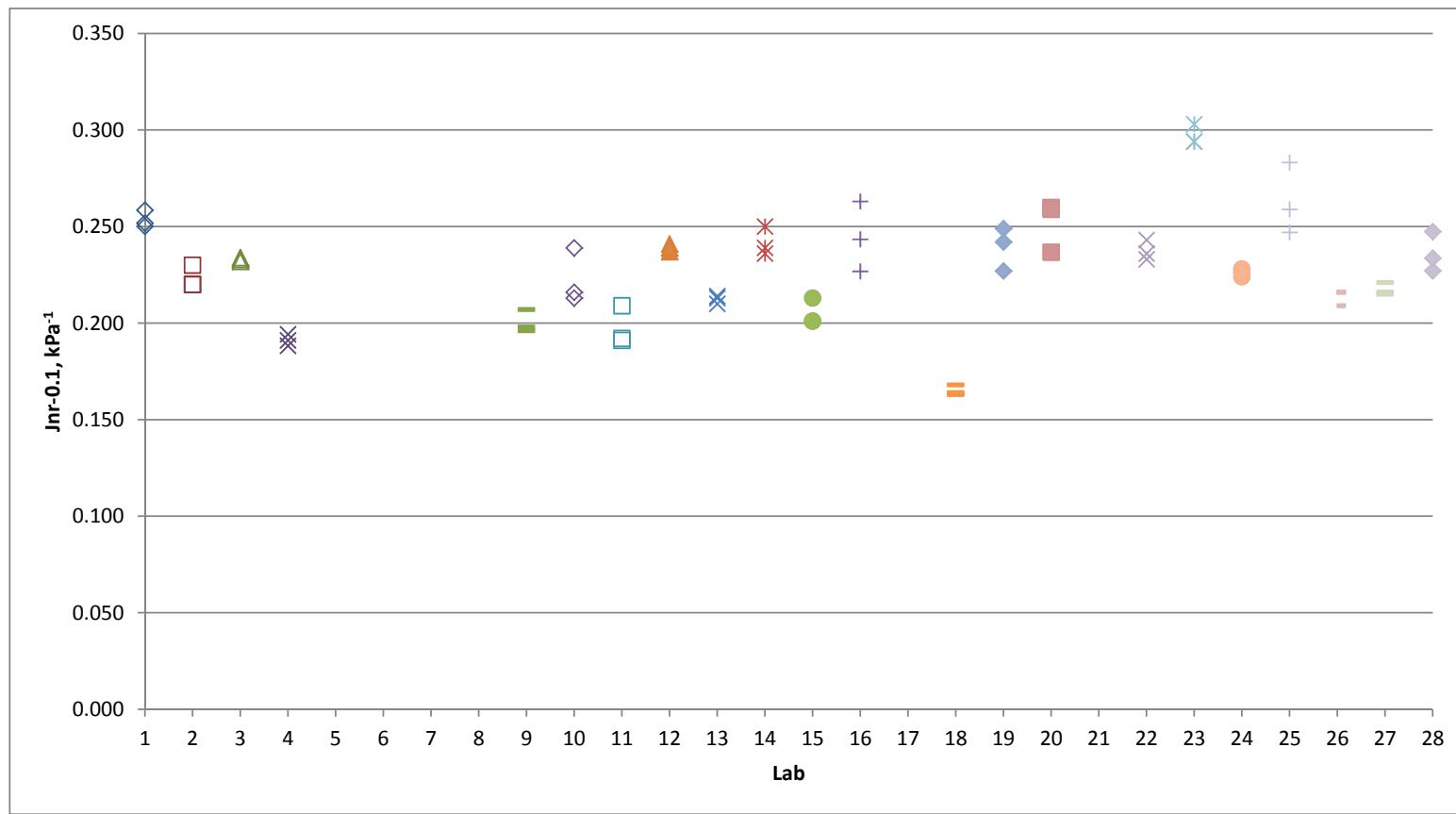
Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		0.250	0.259	0.252	0.25347	0.00444	0.02572	0.92	0.51
2		0.230	0.220	0.220	0.22333	0.00577	-0.00441	-0.16	0.66
3		0.234	0.232	0.233	0.23300	0.00100	0.00526	0.19	0.11
4		0.188	0.194	0.191	0.19120	0.00295	-0.03654	-1.31	0.34
5									
6									
7									
8									
9		0.198	0.207	0.196	0.20033	0.00586	-0.02741	-0.98	0.67
10		0.239	0.213	0.216	0.22267	0.01422	-0.00508	-0.18	1.63
11		0.192	0.191	0.209	0.19733	0.01012	-0.03041	-1.09	1.16
12		0.241	0.237	0.239	0.23900	0.00200	0.01126	0.40	0.23
13		0.210	0.214	0.213	0.21233	0.00208	-0.01541	-0.55	0.24
14		0.236	0.250	0.239	0.24167	0.00737	0.01392	0.50	0.84
15		0.201	0.213	0.201	0.20500	0.00693	-0.02274	-0.82	0.79
16		0.243	0.227	0.263	0.24440	0.01812	0.01666	0.60	2.07
17									
18		0.163	0.164	0.168	0.16500	0.00265	-0.06274	-2.25	0.30
19		0.227	0.249	0.242	0.23933	0.01124	0.01159	0.42	1.29
20		0.260	0.237	0.259	0.25183	0.01312	0.02409	0.87	1.50
21									
22		0.233	0.243	0.236	0.23733	0.00513	0.00959	0.34	0.59
23		0.303	0.294	0.294	0.29700	0.00520	0.06926	2.49	0.60
24		0.224	0.228	0.226	0.22600	0.00200	-0.00174	-0.06	0.23
25		0.283	0.247	0.259	0.26303	0.01845	0.03529	1.27	2.11
26		0.216	0.216	0.209	0.21367	0.00404	-0.01408	-0.51	0.46
27		0.221	0.216	0.215	0.21733	0.00321	-0.01041	-0.37	0.37
28		0.247	0.227	0.234	0.23607	0.01036	0.00833	0.30	1.19

Average of Cell Averages X-bar 0.228

Standard Deviation of Cell Averages s_{X-bar} 0.028

Repeatability Standard Deviation s_r 0.00873 0.029

Reproducibility Standard Deviation s_R 0.029



Binder D64
PG 70-28 (64C)

Jnr (3.2 kPa)

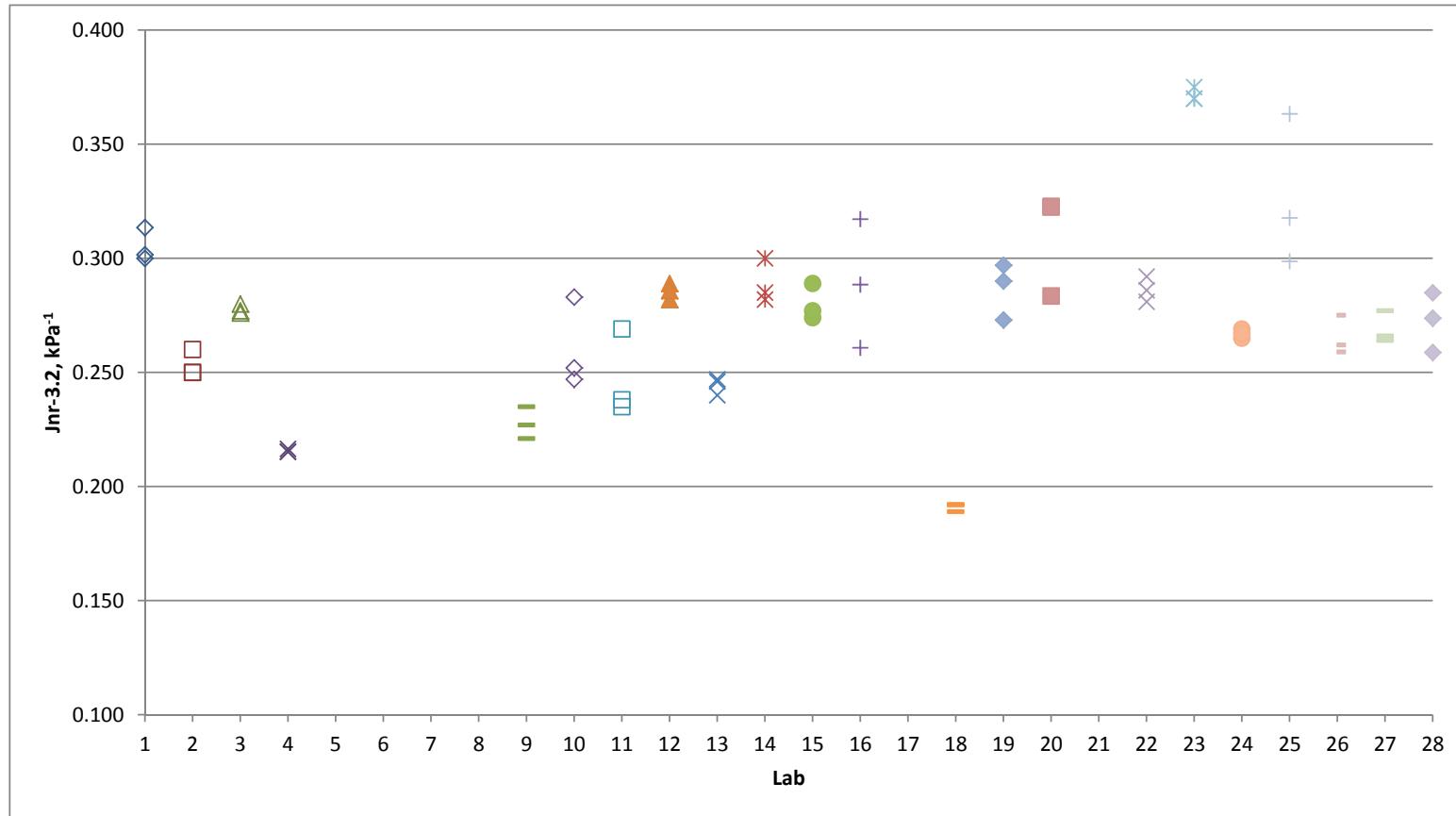
Lab No.	Lab Name	Results, x								
		1	2	3	Average	s	d	h	k	
1		0.300	0.314	0.302	0.30503	0.00738	0.03136	0.83	0.55	
2		0.260	0.250	0.250	0.25333	0.00577	-0.02034	-0.54	0.43	
3		0.280	0.276	0.277	0.27767	0.00208	0.00399	0.11	0.16	
4		0.215	0.215	0.217	0.21567	0.00072	-0.05801	-1.53	0.05	
5										
6										
7										
8										
9		0.227	0.235	0.221	0.22767	0.00702	-0.04601	-1.21	0.52	
10		0.283	0.247	0.252	0.26067	0.01950	-0.01301	-0.34	1.45	
11		0.235	0.238	0.269	0.24733	0.01882	-0.02634	-0.69	1.40	
12		0.289	0.282	0.286	0.28563	0.00351	0.01196	0.32	0.26	
13		0.240	0.246	0.247	0.24433	0.00379	-0.02934	-0.77	0.28	
14		0.282	0.300	0.285	0.28900	0.00964	0.01533	0.40	0.72	
15		0.274	0.289	0.277	0.28000	0.00794	0.00633	0.17	0.59	
16		0.289	0.261	0.317	0.28883	0.02820	0.01516	0.40	2.10	
17										
18		0.192	0.189	0.192	0.19100	0.00173	-0.08267	-2.18	0.13	
19		0.273	0.297	0.290	0.28667	0.01234	0.01299	0.34	0.92	
20		0.323	0.284	0.322	0.30957	0.02258	0.03589	0.95	1.68	
21										
22		0.281	0.292	0.286	0.28633	0.00551	0.01266	0.33	0.41	
23		0.375	0.370	0.370	0.37167	0.00289	0.09799	2.58	0.22	
24		0.265	0.269	0.267	0.26700	0.00200	-0.00667	-0.18	0.15	
25		0.363	0.299	0.318	0.32657	0.03320	0.05289	1.39	2.48	
26		0.275	0.259	0.262	0.26533	0.00850	-0.00834	-0.22	0.63	
27		0.277	0.264	0.266	0.26900	0.00700	-0.00467	-0.12	0.52	
28		0.285	0.259	0.274	0.27251	0.01314	-0.00117	-0.03	0.98	

Average of Cell Averages X-bar 0.274

Standard Deviation of Cell Averages s_{X-bar} 0.038

Repeatability Standard Deviation s_r 0.01341 0.040

Reproducibility Standard Deviation s_R 0.040



Binder D64
PG 70-28 (64C)

Recovery (0.1 kPa)

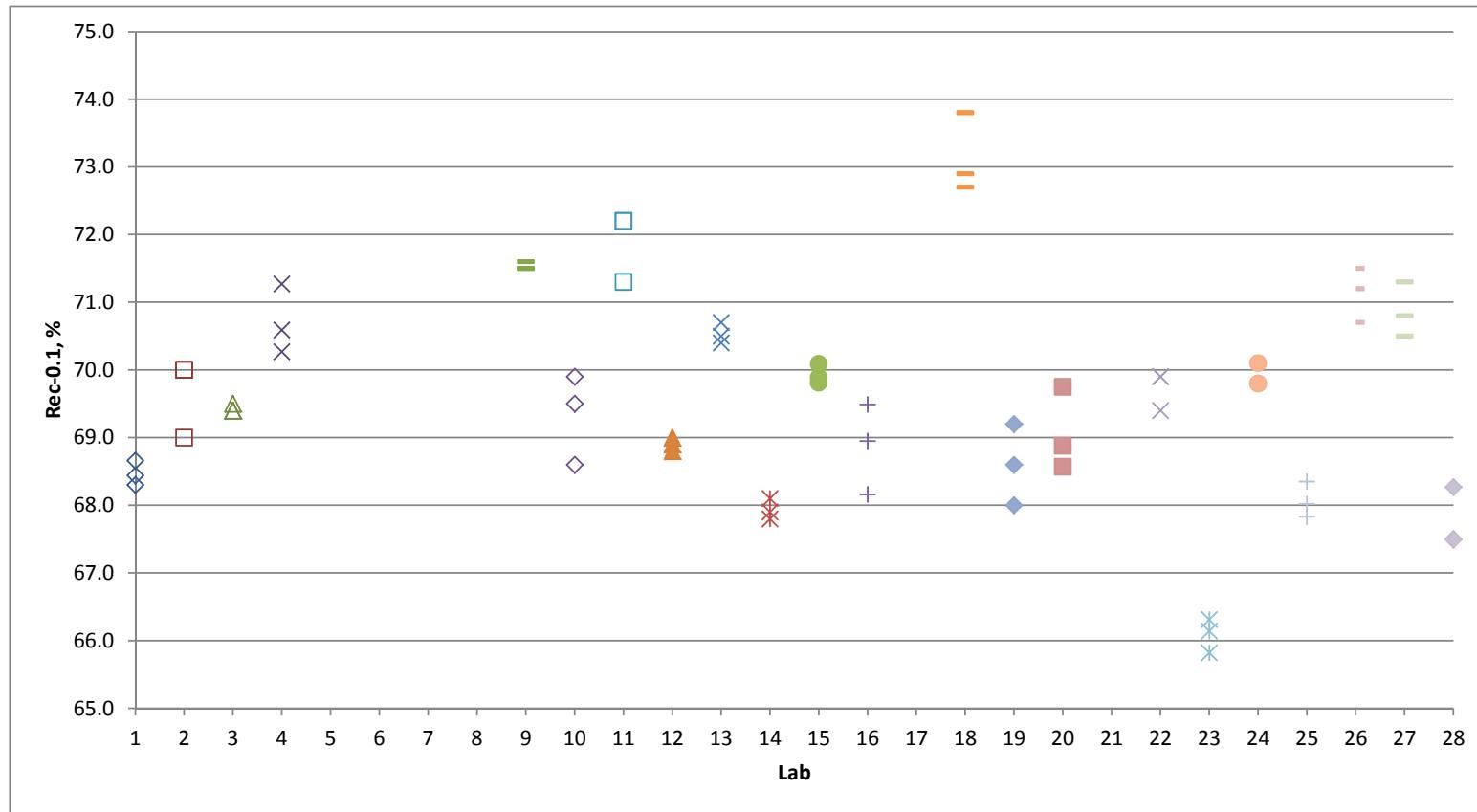
Lab No.	Lab Name	Results, x							
		1	2	3	Average	s	d	h	k
1		68.7	68.3	68.4	68.467	0.181	-1.149	-0.73	0.44
2		69.0	70.0	70.0	69.667	0.577	0.051	0.03	1.40
3		69.4	69.4	69.5	69.433	0.058	-0.183	-0.12	0.14
4		71.3	70.3	70.6	70.710	0.511	1.094	0.69	1.24
5									
6									
7									
8									
9		71.5	71.6	71.5	71.533	0.058	1.917	1.21	0.14
10		68.6	69.5	69.9	69.333	0.666	-0.283	-0.18	1.62
11		72.2	72.2	71.3	71.900	0.520	2.284	1.45	1.26
12		68.9	68.8	69.0	68.900	0.100	-0.716	-0.45	0.24
13		70.7	70.5	70.4	70.533	0.153	0.917	0.58	0.37
14		68.1	67.8	67.9	67.933	0.153	-1.683	-1.07	0.37
15		69.8	69.9	70.1	69.930	0.144	0.314	0.20	0.35
16		69.0	69.5	68.2	68.867	0.669	-0.749	-0.47	1.63
17									
18		73.8	72.9	72.7	73.133	0.586	3.517	2.23	1.43
19		69.2	68.0	68.6	68.600	0.600	-1.016	-0.64	1.46
20		68.9	69.8	68.6	69.067	0.612	-0.549	-0.35	1.49
21									
22		69.9	69.4	69.9	69.733	0.289	0.117	0.07	0.70
23		65.8	66.1	66.3	66.090	0.249	-3.526	-2.23	0.61
24		70.1	69.8	69.8	69.900	0.173	0.284	0.18	0.42
25		68.0	68.4	67.8	68.067	0.263	-1.549	-0.98	0.64
26		71.2	70.7	71.5	71.133	0.404	1.517	0.96	0.98
27		70.8	70.5	71.3	70.867	0.404	1.251	0.79	0.98
28		67.5	67.5	68.3	67.755	0.445	-1.861	-1.18	1.08

Average of Cell Averages X-bar 69.616

Standard Deviation of Cell Averages s_{X-bar} 1.579

Repeatability Standard Deviation s_r 0.41115 1.614

Reproducibility Standard Deviation s_R 1.614



Binder D64
PG 70-28 (64C)

Recovery (3.2 kPa)

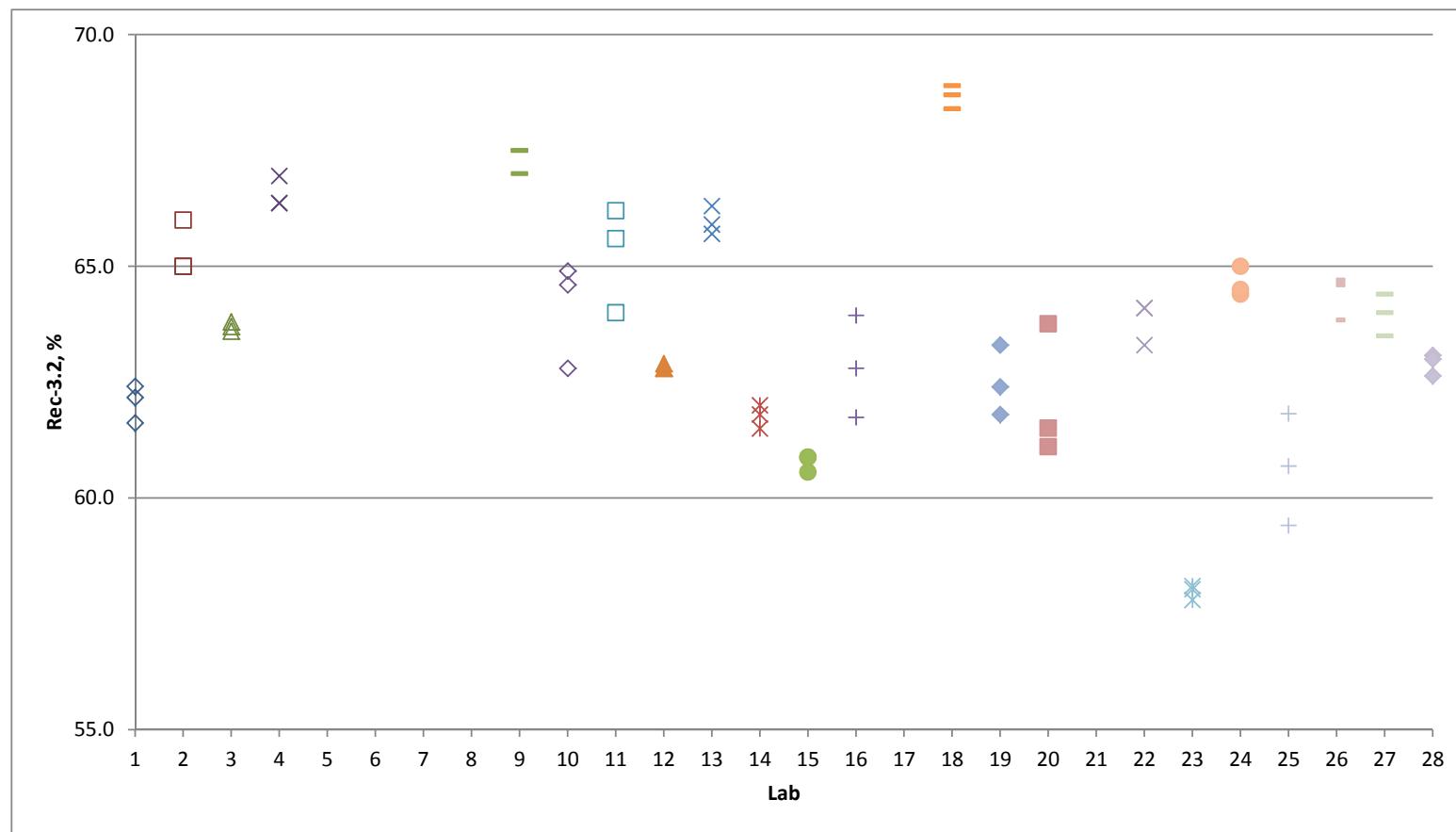
Lab No.	Lab Name	Results, x							
		1	2	3	Average	s	d	h	k
1		62.4	61.6	62.2	62.06667	0.40501	-1.57671	-0.66	0.61
2		65.0	65.0	66.0	65.33333	0.57735	1.68996	0.70	0.87
3		63.6	63.7	63.8	63.70000	0.10000	0.05663	0.02	0.15
4		67.0	66.4	66.4	66.56000	0.33779	2.91663	1.22	0.51
5									
6									
7									
8									
9		67.0	67.5	67.5	67.33333	0.28868	3.68996	1.54	0.44
10		62.8	64.6	64.9	64.10000	1.13578	0.45663	0.19	1.72
11		66.2	65.6	64.0	65.26667	1.13725	1.62329	0.68	1.72
12		62.8	62.8	62.9	62.83333	0.05774	-0.81004	-0.34	0.09
13		66.3	65.9	65.7	65.96667	0.30551	2.32329	0.97	0.46
14		62.0	61.5	61.8	61.76667	0.25166	-1.87671	-0.78	0.38
15		60.9	60.6	60.9	60.77333	0.18475	-2.87004	-1.20	0.28
16		62.8	63.9	61.7	62.82667	1.10024	-0.81671	-0.34	1.66
17									
18		68.9	68.7	68.4	68.66667	0.25166	5.02329	2.09	0.38
19		63.3	61.8	62.4	62.50000	0.75498	-1.14337	-0.48	1.14
20		61.5	63.8	61.1	62.12667	1.42858	-1.51671	-0.63	2.16
21									
22		64.1	63.3	64.1	63.83333	0.46188	0.18996	0.08	0.70
23		57.8	58.0	58.1	57.97667	0.15695	-5.66671	-2.36	0.24
24		65.0	64.4	64.5	64.63333	0.32146	0.98996	0.41	0.49
25		59.4	61.8	60.7	60.64000	1.20578	-3.00337	-1.25	1.82
26		63.8	64.6	64.7	64.38000	0.47032	0.73663	0.31	0.71
27		63.5	64.0	64.4	63.96667	0.45092	0.32329	0.13	0.68
28		62.6	63.1	63.0	62.90422	0.23488	-0.73915	-0.31	0.35

Average of Cell Averages X-bar 63.643

Standard Deviation of Cell Averages s_{X-bar} 2.400

Repeatability Standard Deviation s_r 0.66202 2.460

Reproducibility Standard Deviation s_R 2.460



Binder D64
PG 70-28 (64C)

Jnr-Diff

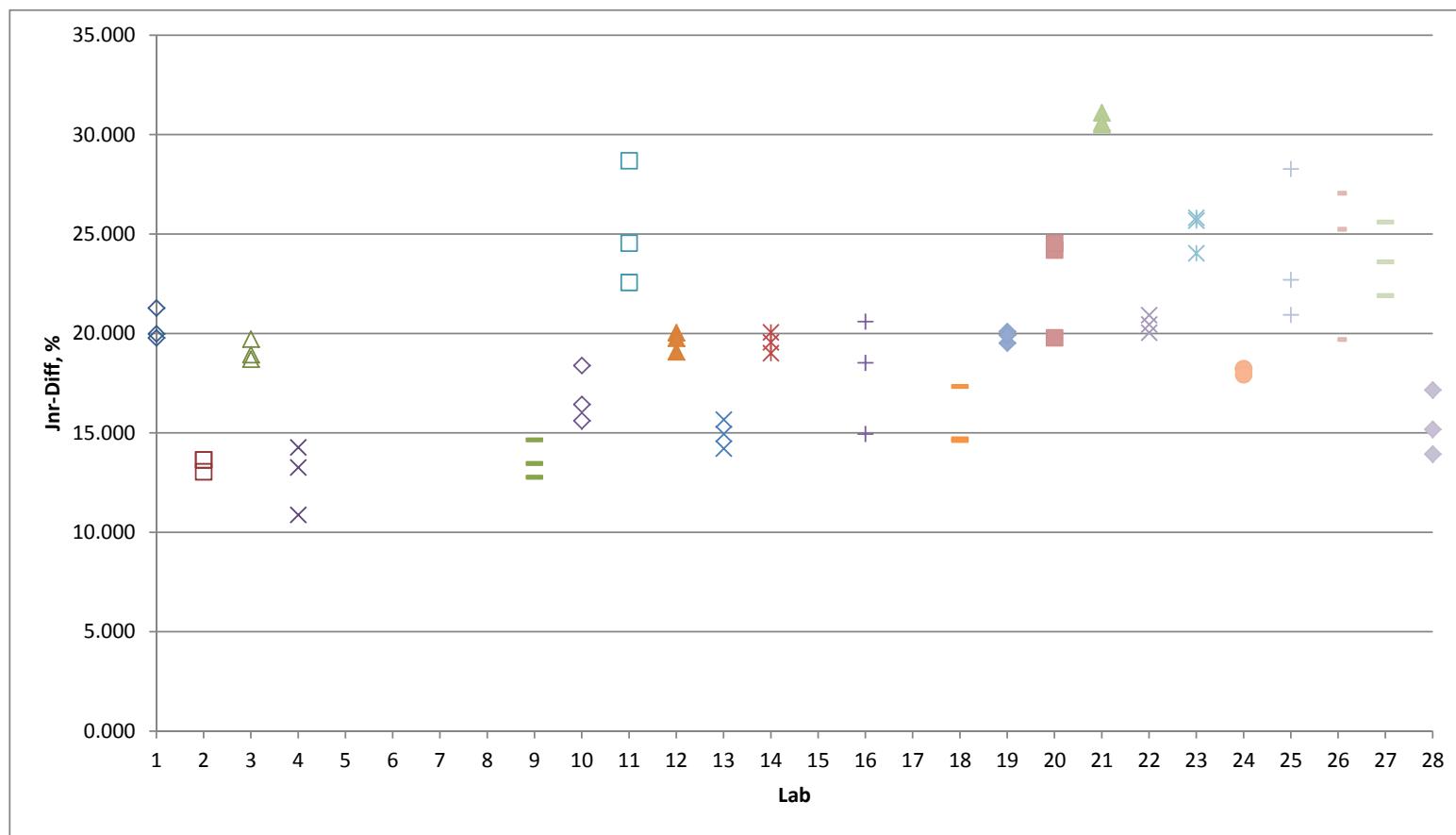
Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		19.980	21.280	19.780	20.34667	0.81445	0.64916	0.14	0.45
2		13.043	13.636	13.636	13.43874	0.34230	-6.25877	-1.36	0.19
3		19.716	18.706	18.934	19.11867	0.52972	-0.57884	-0.13	0.29
4		14.270	10.880	13.260	12.80333	1.74053	-6.89417	-1.50	0.96
5									
6									
7									
8									
9		14.650	13.460	12.770	13.62667	0.95102	-6.07084	-1.32	0.52
10		18.388	15.613	16.434	16.81167	1.42553	-2.88584	-0.63	0.79
11		22.560	24.537	28.679	25.25867	3.12268	5.56116	1.21	1.72
12		20.045	19.078	19.764	19.62900	0.49743	-0.06850	-0.01	0.27
13		14.209	14.943	15.666	14.93933	0.72851	-4.75817	-1.04	0.40
14		19.557	20.058	19.013	19.54267	0.52265	-0.15484	-0.03	0.29
15									
16		18.526	14.948	20.595	18.02300	2.85691	-1.67450	-0.37	1.58
17									
18		17.331	14.700	14.617	15.54933	1.54353	-4.14817	-0.90	0.85
19		20.093	19.520	19.919	19.84400	0.29377	0.14650	0.03	0.16
20		24.190	19.780	24.530	22.83333	2.64972	3.13583	0.68	1.46
21		31.100	30.500	30.600	30.73333	0.32146	11.03583	2.41	0.18
22		20.451	20.041	20.923	20.47167	0.44136	0.77416	0.17	0.24
23		24.033	25.670	25.813	25.17200	0.98899	5.47450	1.19	0.55
24		18.230	18.200	17.920	18.11667	0.17098	-1.58084	-0.34	0.09
25		28.270	20.940	22.700	23.97000	3.82647	4.27250	0.93	2.11
26		27.049	19.691	25.236	23.99200	3.83350	4.29450	0.94	2.12
27		25.600	21.900	23.600	23.70000	1.85203	4.00250	0.87	1.02
28		15.176	13.936	17.161	15.42432	1.62657	-4.27319	-0.93	0.90

Average of Cell Averages X-bar 19.698

Standard Deviation of Cell Averages s_{X-bar} 4.587

Repeatability Standard Deviation s_r 1.81158 4.820

Reproducibility Standard Deviation s_R 4.820



Binder E

PG 76-22

Jnr (0.1 kPa)

Lab No.	Lab Name	Results, x								
		1	2	3	Average	s	d	h	k	
1		0.194	0.195	0.192	0.19353	0.00132	0.00823	0.31	0.13	
2		0.180	0.180	0.180	0.18000	0.00000	-0.00530	-0.20	0.00	
3		0.188	0.184	0.179	0.18367	0.00451	-0.00163	-0.06	0.45	
4		0.142	0.148	0.142	0.14383	0.00328	-0.04147	-1.56	0.32	
5		0.274	0.259	0.261	0.26467	0.00814	0.07937	2.99	0.81	
6		0.210	0.210	0.193	0.20433	0.00981	0.01903	0.72	0.97	
7		0.205	0.204	0.226	0.21167	0.01242	0.02637	0.99	1.23	
8		0.191	0.180	0.180	0.18367	0.00635	-0.00163	-0.06	0.63	
9		0.180	0.183	0.182	0.18167	0.00153	-0.00363	-0.14	0.15	
10		0.208	0.187	0.177	0.19067	0.01582	0.00537	0.20	1.57	
11		0.154	0.156	0.151	0.15367	0.00252	-0.03163	-1.19	0.25	
12		0.192	0.187	0.197	0.19200	0.00500	0.00670	0.25	0.50	
13		0.187	0.186	0.191	0.18800	0.00265	0.00270	0.10	0.26	
14		0.198	0.195	0.202	0.19833	0.00351	0.01303	0.49	0.35	
15		0.179	0.169	0.170	0.17267	0.00551	-0.01263	-0.48	0.55	
16		0.211	0.203	0.201	0.20520	0.00535	0.01990	0.75	0.53	
17		0.140	0.120	0.140	0.13333	0.01155	-0.05197	-1.96	1.14	
18		0.100	0.168	0.175	0.14767	0.04143	-0.03763	-1.42	4.10	
19		0.187	0.193	0.185	0.18833	0.00416	0.00303	0.11	0.41	
20		0.199	0.217	0.205	0.20673	0.00929	0.02143	0.81	0.92	
21		0.217	0.220	0.216	0.21767	0.00208	0.03237	1.22	0.21	
22		0.196	0.202	0.205	0.20100	0.00458	0.01570	0.59	0.45	
23		0.180	0.189	0.189	0.18600	0.00520	0.00070	0.03	0.51	
24		0.171	0.171	0.164	0.16867	0.00404	-0.01663	-0.63	0.40	
25		0.190	0.188	0.199	0.19213	0.00637	0.00683	0.26	0.63	
26		0.149	0.157	0.158	0.15467	0.00493	-0.03063	-1.16	0.49	
27		0.154	0.156	0.160	0.15667	0.00306	-0.02863	-1.08	0.30	
28		0.188	0.185	0.191	0.18793	0.00281	0.00263	0.10	0.28	

Average of Cell Averages

X-bar 0.185

Standard Deviation of Cell Averages

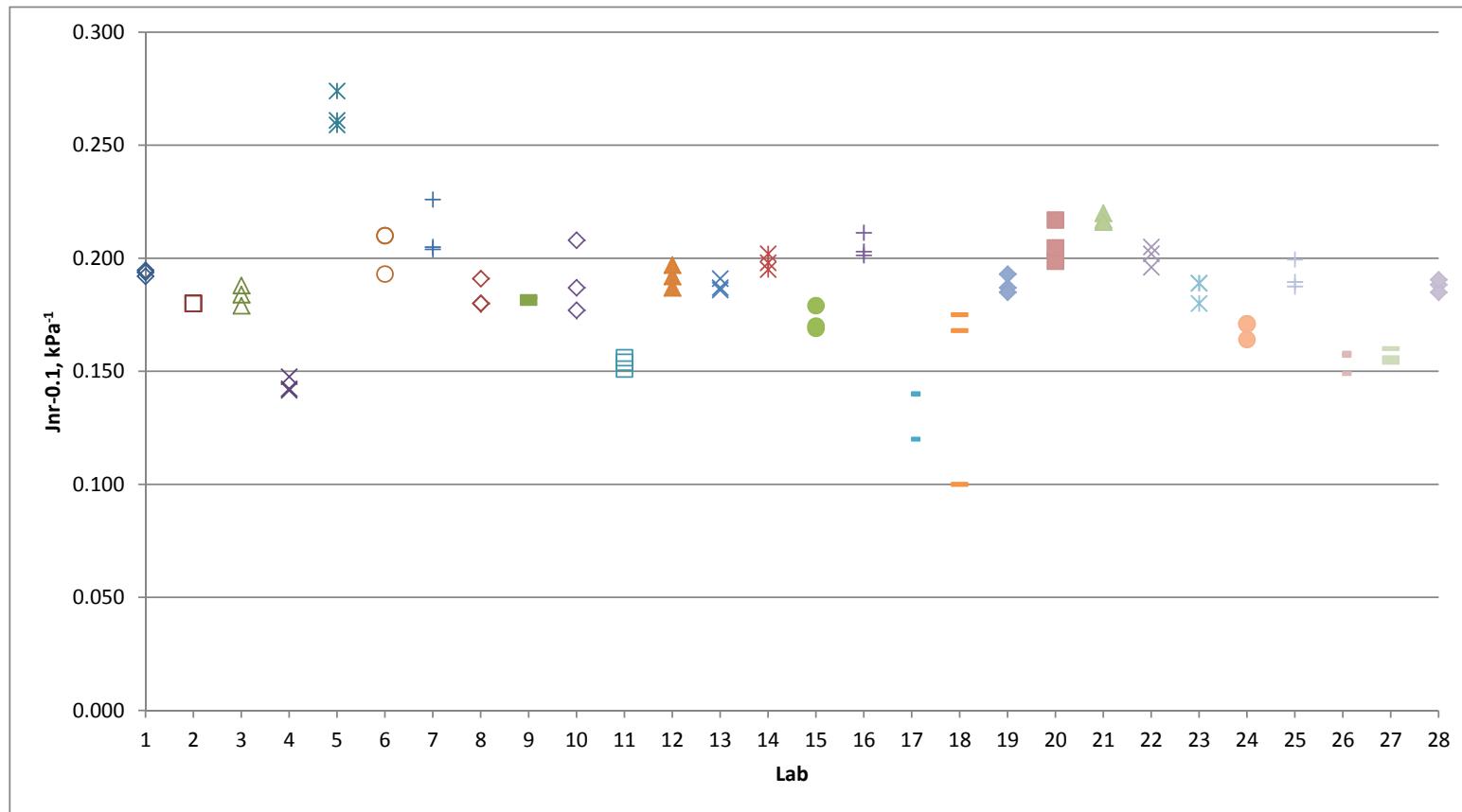
s_{X-bar} 0.027

Repeatability Standard Deviation

s_r 0.01010 0.028

Reproducibility Standard Deviation

s_R 0.028



Binder E

PG 76-22

Jnr (3.2 kPa)

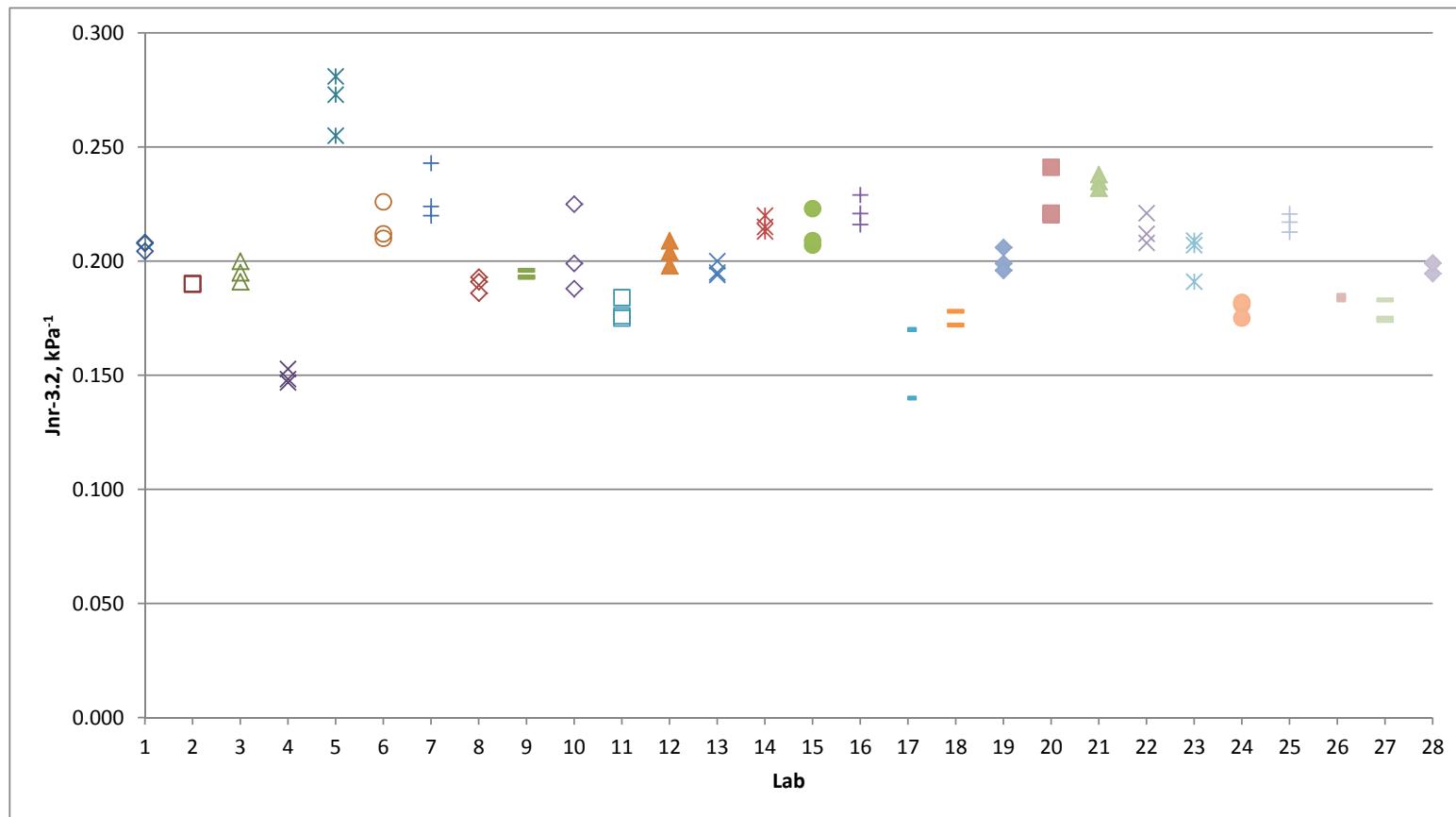
Lab No.	Lab Name	Results, x								
		1	2	3	Average	s	d	h	k	
1		0.208	0.208	0.204	0.20680	0.00209	0.00528	0.22	0.27	
2		0.190	0.190	0.190	0.19000	0.00000	-0.01152	-0.47	0.00	
3		0.200	0.195	0.191	0.19533	0.00451	-0.00618	-0.25	0.58	
4		0.148	0.153	0.147	0.14933	0.00308	-0.05218	-2.14	0.39	
5		0.281	0.273	0.255	0.26967	0.01332	0.06815	2.79	1.70	
6		0.212	0.226	0.210	0.21600	0.00872	0.01448	0.59	1.12	
7		0.220	0.224	0.243	0.22900	0.01229	0.02748	1.13	1.57	
8		0.193	0.191	0.186	0.19000	0.00361	-0.01152	-0.47	0.46	
9		0.193	0.196	0.193	0.19400	0.00173	-0.00752	-0.31	0.22	
10		0.225	0.199	0.188	0.20400	0.01900	0.00248	0.10	2.43	
11		0.176	0.184	0.175	0.17833	0.00493	-0.02318	-0.95	0.63	
12		0.204	0.198	0.209	0.20367	0.00551	0.00215	0.09	0.70	
13		0.195	0.194	0.200	0.19633	0.00321	-0.00518	-0.21	0.41	
14		0.215	0.213	0.220	0.21600	0.00361	0.01448	0.59	0.46	
15		0.223	0.207	0.209	0.21300	0.00872	0.01148	0.47	1.12	
16		0.229	0.216	0.221	0.22200	0.00652	0.02048	0.84	0.83	
17		0.170	0.140	0.170	0.16000	0.01732	-0.04152	-1.70	2.22	
18		0.172	0.178	0.17500	0.00424	-0.02652	-1.09	0.54		
19		0.199	0.206	0.196	0.20033	0.00513	-0.00118	-0.05	0.66	
20		0.220	0.241	0.221	0.22747	0.01181	0.02595	1.06	1.51	
21		0.235	0.238	0.232	0.23500	0.00300	0.03348	1.37	0.38	
22		0.208	0.212	0.221	0.21367	0.00666	0.01215	0.50	0.85	
23		0.191	0.207	0.209	0.20233	0.00987	0.00082	0.03	1.26	
24		0.181	0.182	0.175	0.17933	0.00379	-0.02218	-0.91	0.48	
25		0.213	0.217	0.221	0.21687	0.00396	0.01535	0.63	0.51	
26		0.183	0.184	0.185	0.18400	0.00100	-0.01752	-0.72	0.13	
27		0.175	0.183	0.174	0.17733	0.00493	-0.02418	-0.99	0.63	
28		0.199	0.195	0.199	0.19766	0.00265	-0.00386	-0.16	0.34	

Average of Cell Averages X-bar 0.202

Standard Deviation of Cell Averages s_{X-bar} 0.024

Repeatability Standard Deviation s_r 0.00781 0.025

Reproducibility Standard Deviation s_R 0.025



Binder E

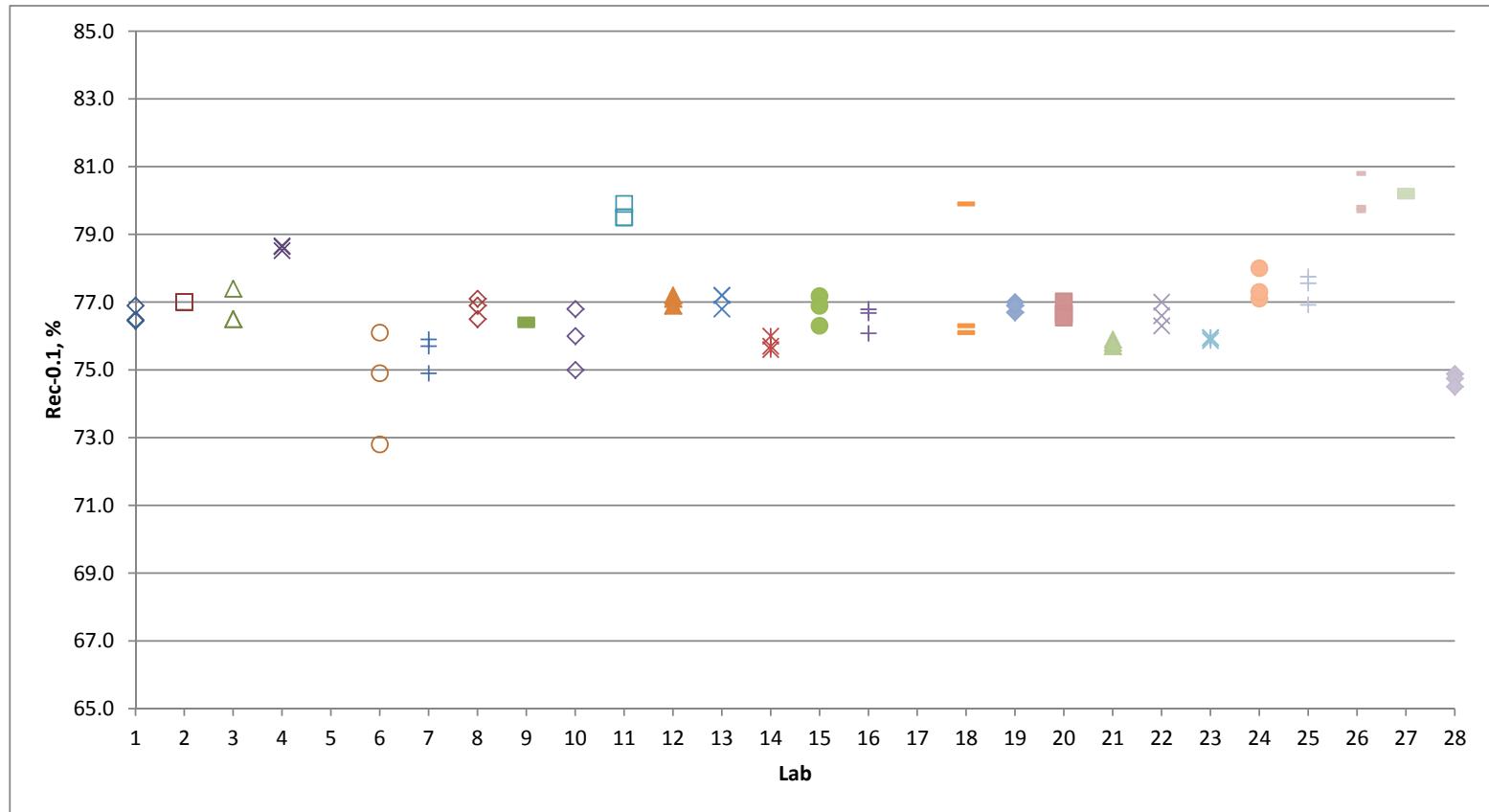
PG 76-22

Recovery (0.1 kPa)

Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		76.5	76.5	76.9	76.610	0.252	-0.329	-0.23	0.40
2		77.0	77.0	77.0	77.000	0.000	0.061	0.04	0.00
3		76.5	76.5	77.4	76.800	0.520	-0.139	-0.10	0.82
4		78.5	78.7	78.6	78.607	0.076	1.668	1.19	0.12
5									
6		72.8	74.9	76.1	74.600	1.670	-2.339	-1.66	2.63
7		75.7	75.9	74.9	75.500	0.529	-1.439	-1.02	0.83
8		76.5	77.1	76.9	76.833	0.306	-0.105	-0.07	0.48
9		76.4	76.3	76.5	76.400	0.100	-0.539	-0.38	0.16
10		75.0	76.0	76.8	75.933	0.902	-1.005	-0.71	1.42
11		79.5	79.5	79.9	79.633	0.231	2.695	1.92	0.36
12		77.1	77.2	76.9	77.067	0.153	0.128	0.09	0.24
13		77.2	77.2	76.8	77.067	0.231	0.128	0.09	0.36
14		75.7	76.0	75.6	75.767	0.208	-1.172	-0.83	0.33
15		76.3	77.2	76.9	76.790	0.448	-0.149	-0.11	0.71
16		76.1	76.8	76.7	76.517	0.382	-0.422	-0.30	0.60
17									
18		79.9	76.3	76.1	77.433	2.139	0.495	0.35	3.37
19		77.0	76.7	76.9	76.867	0.153	-0.072	-0.05	0.24
20		77.0	76.7	76.5	76.737	0.251	-0.202	-0.14	0.40
21		75.9	75.7	75.8	75.800	0.100	-1.139	-0.81	0.16
22		77.0	76.6	76.3	76.633	0.351	-0.305	-0.22	0.55
23		76.0	75.9	75.9	75.923	0.047	-1.015	-0.72	0.07
24		77.1	77.3	78.0	77.467	0.473	0.528	0.38	0.74
25		77.6	77.8	76.9	77.410	0.435	0.471	0.34	0.69
26		80.8	79.7	79.8	80.100	0.608	3.161	2.25	0.96
27		80.1	80.2	80.3	80.200	0.100	3.261	2.32	0.16
28		74.9	74.7	74.5	74.712	0.189	-2.227	-1.58	0.30

Average of Cell Averages
 Standard Deviation of Cell Averages
 Repeatability Standard Deviation
 Reproducibility Standard Deviation

X-bar 76.939
 $s_{\bar{x}}$ 1.406
 s_r 0.63457 1.499
 s_R 1.499



Binder E

PG 76-22

Recovery (3.2 kPa)

Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		75.2	75.3	75.8	75.42667	0.33232	-0.10867	-0.08	0.56
2		75.0	76.0	76.0	75.66667	0.57735	0.13133	0.10	0.98
3		75.4	75.5	76.4	75.76667	0.55076	0.23133	0.18	0.93
4		78.0	78.1	78.1	78.04000	0.06083	2.50467	1.95	0.10
5									
6		74.9	73.4	74.3	74.20000	0.75498	-1.33533	-1.04	1.28
7		74.2	74.0	73.4	73.86667	0.41633	-1.66867	-1.30	0.71
8		76.6	76.1	76.6	76.43333	0.28868	0.89800	0.70	0.49
9		75.2	75.0	75.4	75.20000	0.20000	-0.33533	-0.26	0.34
10		73.5	74.8	75.8	74.70000	1.15326	-0.83533	-0.65	1.96
11		77.2	76.6	77.4	77.06667	0.41633	1.53133	1.19	0.71
12		76.1	76.2	75.9	76.06667	0.15275	0.53133	0.41	0.26
13		76.5	76.6	76.1	76.40000	0.26458	0.86467	0.67	0.45
14		74.2	74.4	74.0	74.20000	0.20000	-1.33533	-1.04	0.34
15		72.3	73.8	73.4	73.16000	0.80951	-2.37533	-1.85	1.37
16		74.8	75.7	75.1	75.21667	0.45622	-0.31867	-0.25	0.77
17									
18		79.1	75.9	75.8	76.93333	1.87705	1.39800	1.09	3.18
19		76.0	75.6	75.9	75.83333	0.20817	0.29800	0.23	0.35
20		75.1	74.7	75.1	74.96333	0.24786	-0.57200	-0.45	0.42
21		74.4	74.3	74.4	74.36667	0.05774	-1.16867	-0.91	0.10
22		75.9	75.7	75.0	75.53333	0.47258	-0.00200	0.00	0.80
23		74.7	74.2	74.0	74.28667	0.40772	-1.24867	-0.97	0.69
24		76.2	76.2	76.9	76.43333	0.40415	0.89800	0.70	0.69
25		75.4	74.9	75.0	75.09667	0.23714	-0.43867	-0.34	0.40
26		77.3	76.9	77.1	77.10000	0.20000	1.56467	1.22	0.34
27		78.0	77.3	78.9	78.06667	0.80208	2.53133	1.97	1.36
28		73.9	73.9	73.9	73.89529	0.03020	-1.64004	-1.28	0.05

Average of Cell Averages

X-bar 75.535

Standard Deviation of Cell Averages

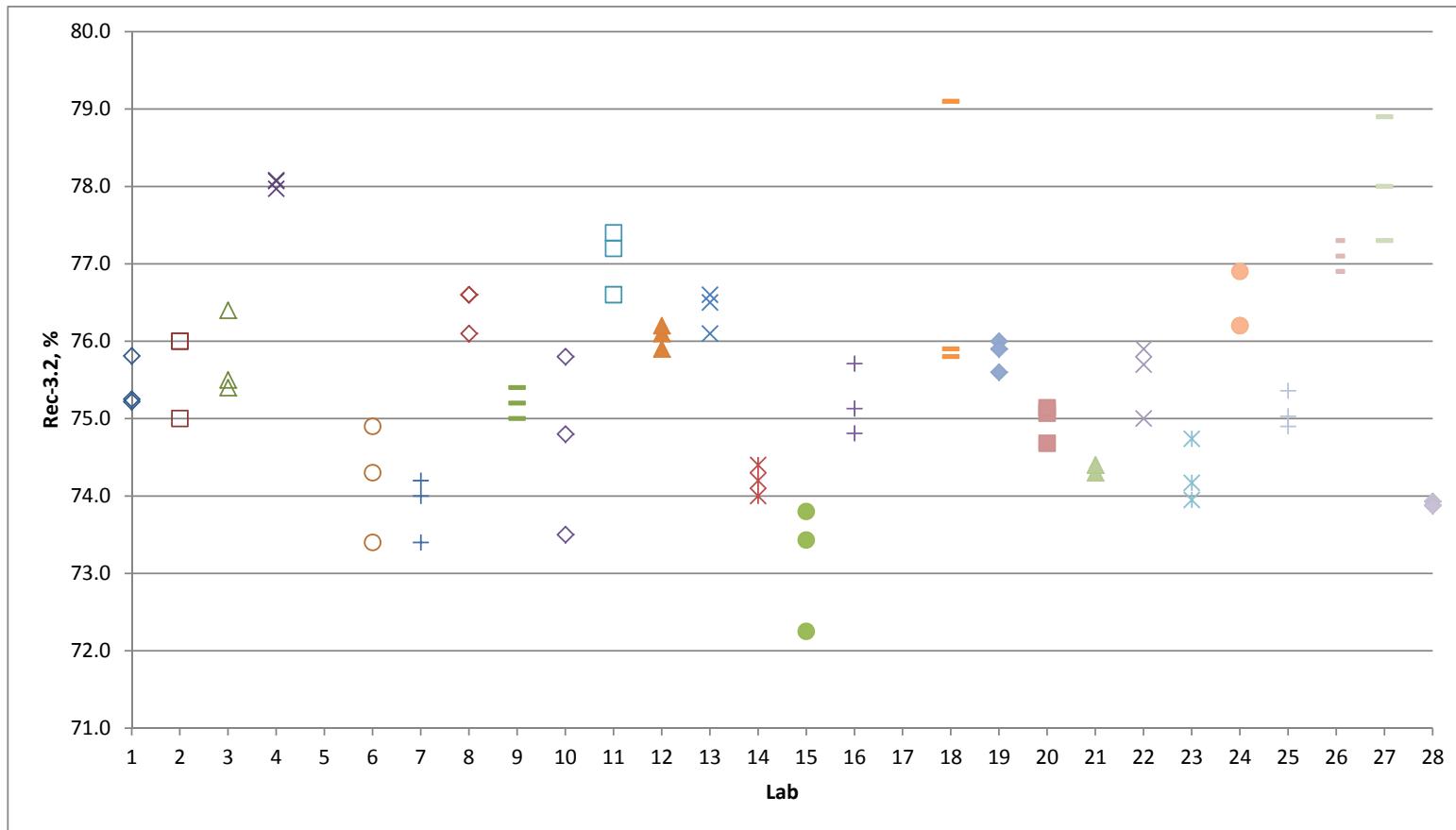
s_{X-bar} 1.285

Repeatability Standard Deviation

s_r 0.58973 1.372

Reproducibility Standard Deviation

s_R 1.372



Binder E

PG 76-22

Jnr-Diff

Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		7.250	6.960	6.430	6.88000	0.41581	-1.78763	-0.34	0.22
2		5.556	5.556	5.556	5.55556	0.00000	-3.11207	-0.60	0.00
3		6.132	5.966	6.338	6.14533	0.18636	-2.52229	-0.49	0.10
4		4.202	3.547	3.732	3.82700	0.33768	-4.84063	-0.93	0.18
5		2.480	5.290		3.88500	1.98697	-4.78263	-0.92	1.06
6		0.653	7.881	8.738	5.75733	4.44120	-2.91029	-0.56	2.36
7		7.458	9.973	7.645	8.35867	1.40118	-0.30896	-0.06	0.74
8		1.039	6.304	3.032	3.45833	2.65827	-5.20929	-1.00	1.41
9		6.910	6.852	6.051	6.60433	0.48008	-2.06329	-0.40	0.26
10		8.173	6.777	6.435	7.12833	0.92073	-1.53929	-0.30	0.49
11		14.191	17.653	15.411	15.75167	1.75596	7.08404	1.36	0.93
12		6.128	5.896	6.224	6.08267	0.16863	-2.58496	-0.50	0.09
13		4.438	4.221	5.007	4.55533	0.40592	-4.11229	-0.79	0.22
14		8.628	9.069	8.712	8.80300	0.23416	0.13537	0.03	0.12
15		24.710	22.910	22.850	23.49000	1.05698	14.82237	2.85	0.56
16		8.341	6.435	9.757	8.17767	1.66701	-0.48996	-0.09	0.89
17		21.700	18.100	17.500	19.10000	2.27156	10.43237	2.01	1.21
18		3.681	2.977	2.240	2.96600	0.72056	-5.70163	-1.10	0.38
19		6.430	6.504	6.084	6.33933	0.22420	-2.32829	-0.45	0.12
20		10.910	11.150	8.028	10.02933	1.73735	1.36171	0.26	0.92
21		7.900	8.100	7.700	7.90000	0.20000	-0.76763	-0.15	0.11
22		5.932	4.665	7.653	6.08333	1.49974	-2.58429	-0.50	0.80
23		5.892	9.362	10.804	8.68600	2.52481	0.01837	0.00	1.34
24		5.772	6.471	6.775	6.33933	0.51430	-2.32829	-0.45	0.27
25		12.280	15.760	10.680	12.90667	2.59733	4.23904	0.82	1.38
26		23.427	17.564	17.280	19.42367	3.46990	10.75604	2.07	1.84
27		13.200	17.900	8.750	13.28333	4.57557	4.61571	0.89	2.43
28		5.775	5.213	4.541	5.17634	0.61796	-3.49129	-0.67	0.33

Average of Cell Averages

X-bar 8.668

Standard Deviation of Cell Averages

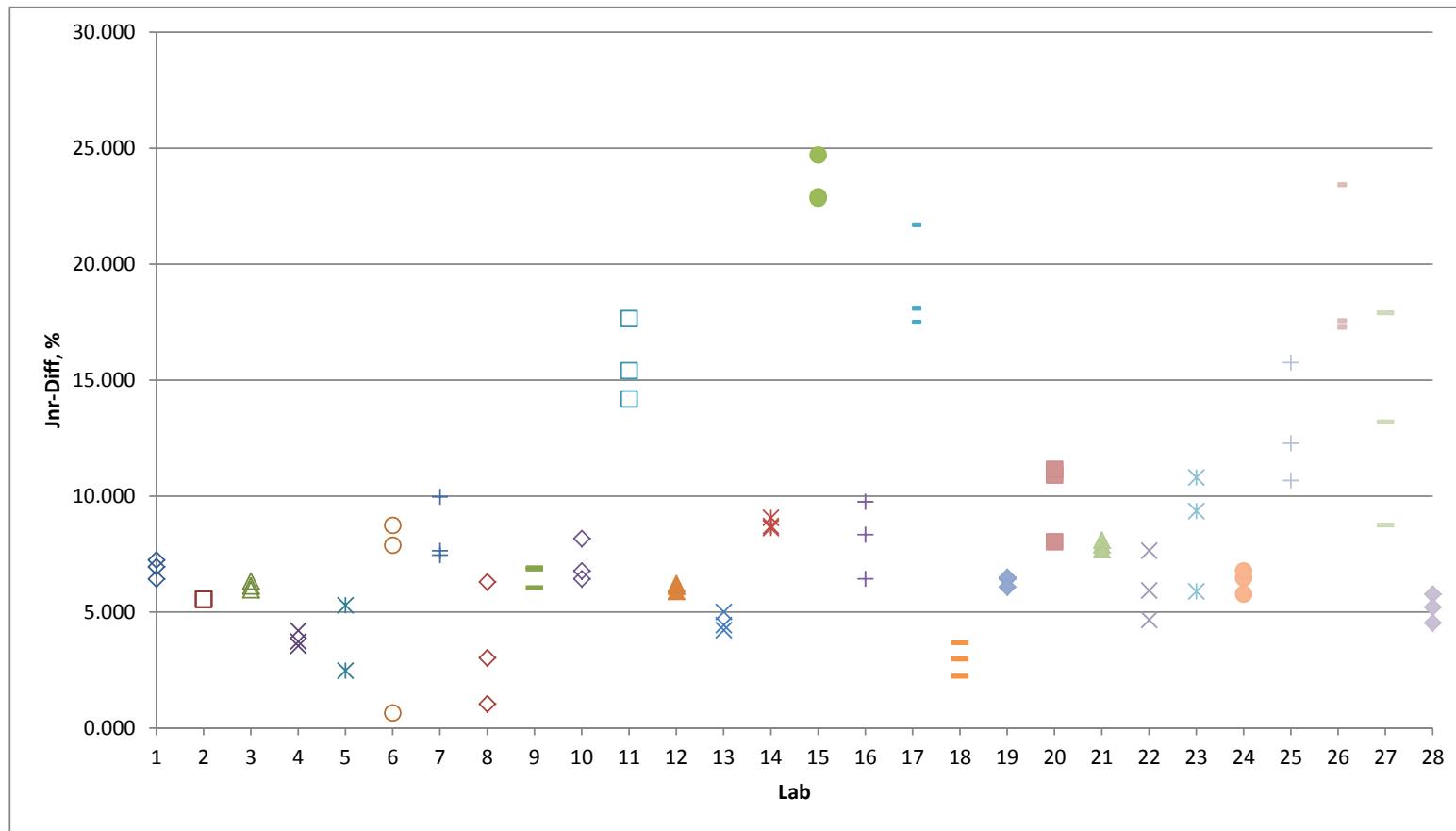
s_{X-bar} 5.200

Repeatability Standard Deviation

s_r 1.88139 5.422

Reproducibility Standard Deviation

s_R 5.422



Jnr (0.1 kPa)

ID	Binder	X-bar	S _{X-bar}	S _r	S _R	r	R	Repeatability		Reproducibility	
								1s%	d2s%	1s%	d2s%
A	PG 58-28	2.70129	0.23103	0.07352	0.23870	0.20586	0.66837	2.7%	7.6%	8.8%	24.7%
B	PG 64-22	2.35547	0.20889	0.08945	0.22129	0.25045	0.61962	3.8%	10.6%	9.4%	26.3%
C	PG 64-28	1.00487	0.12066	0.05185	0.12787	0.14517	0.35805	5.2%	14.4%	12.7%	35.6%
C64	PG 64-28	2.39561	0.25444	0.12250	0.27339	0.34300	0.76550	5.1%	14.3%	11.4%	32.0%
D	PG 70-28	0.10115	0.01832	0.00631	0.01903	0.01766	0.05328	6.2%	17.5%	18.8%	52.7%
D64	PG 70-28	0.22774	0.02783	0.00873	0.02873	0.02445	0.08044	3.8%	10.7%	12.6%	35.3%
E	PG 76-22	0.18530	0.02650	0.01010	0.02776	0.02828	0.07772	5.5%	15.3%	15.0%	41.9%

Jnr (3.2 kPa)

ID	Binder	X-bar	S _{X-bar}	S _r	S _R	r	R	Repeatability		Reproducibility	
								1s%	d2s%	1s%	d2s%
A	PG 58-28	2.98425	0.24593	0.07151	0.25277	0.20023	0.70776	2.4%	6.7%	8.5%	23.7%
B	PG 64-22	2.59292	0.22707	0.08968	0.23858	0.25110	0.66804	3.5%	9.7%	9.2%	25.8%
C	PG 64-28	1.34383	0.16748	0.05887	0.17424	0.16483	0.48788	4.4%	12.3%	13.0%	36.3%
C64	PG 64-28	3.27558	0.27039	0.17965	0.30761	0.50303	0.86132	5.5%	15.4%	9.4%	26.3%
D	PG 70-28	0.10454	0.01576	0.00481	0.01624	0.01347	0.04548	4.6%	12.9%	15.5%	43.5%
D64	PG 70-28	0.27367	0.03796	0.01341	0.03951	0.03756	0.11062	4.9%	13.7%	14.4%	40.4%
E	PG 76-22	0.20152	0.02439	0.00781	0.02521	0.02187	0.07059	3.9%	10.9%	12.5%	35.0%

Recovery (0.1 kPa)

ID	Binder	X-bar	S _{X-bar}	S _r	S _R	r	R	Repeatability		Reproducibility	
								1s%	d2s%	1s%	d2s%
A	PG 58-28	3.46081	1.26969	1.03259	1.52412	2.89126	4.26754	29.8%	83.5%	44.0%	123.3%
B	PG 64-22	3.56747	1.36551	0.72336	1.48777	2.02542	4.16575	20.3%	56.8%	41.7%	116.8%
C	PG 64-28	24.19462	2.40892	0.90147	2.51886	2.52412	7.05281	3.7%	10.4%	10.4%	29.2%
C64	PG 64-28	17.10437	1.83866	0.90671	1.98210	2.53878	5.54989	5.3%	14.8%	11.6%	32.4%
D	PG 70-28	75.09471	1.71304	0.54028	1.76893	1.51280	4.95299	0.7%	2.0%	2.4%	6.6%
D64	PG 70-28	69.61601	1.57863	0.41115	1.61393	1.15122	4.51899	0.6%	1.7%	2.3%	6.5%
E	PG 76-22	76.93866	1.40618	0.63457	1.49860	1.77681	4.19607	0.8%	2.3%	1.9%	5.5%

Recovery (3.2 kPa)

ID	Binder	X-bar	S _{X-bar}	S _r	S _R	r	R	Repeatability		Reproducibility	
								1s%	d2s%	1s%	d2s%
A	PG 58-28	0.71720	0.48676	0.14224	0.50042	0.39827	1.40117	19.8%	55.5%	69.8%	195.4%
B	PG 64-22	1.00146	0.60288	0.30558	0.65247	0.85562	1.82690	30.5%	85.4%	65.2%	182.4%
C	PG 64-28	6.98704	1.70065	0.47322	1.74399	1.32501	4.88317	6.8%	19.0%	25.0%	69.9%
C64	PG 64-28	2.17981	0.85302	0.16252	0.86328	0.45505	2.41718	7.5%	20.9%	39.6%	110.9%
D	PG 70-28	73.80076	1.76148	0.46081	1.80122	1.29027	5.04341	0.6%	1.7%	2.4%	6.8%
D64	PG 70-28	63.64337	2.40014	0.66202	2.46025	1.85365	6.88871	1.0%	2.9%	3.9%	10.8%
E	PG 76-22	75.53533	1.28502	0.58973	1.37227	1.65125	3.84235	0.8%	2.2%	1.8%	5.1%

Jnr-Diff

ID	Binder	X-bar	S _{X-bar}	S _r	S _R	r	R	Repeatability		Reproducibility	
								1s%	d2s%	1s%	d2s%
A	PG 58-28	10.49013	1.59586	1.46571	1.99474	4.10399	5.58526	14.0%	39.1%	19.0%	53.2%
B	PG 64-22	9.63297	0.71368	1.32450	1.32450	3.70860	3.70860	13.7%	38.5%	13.7%	38.5%
C	PG 64-28	32.98853	2.65502	2.05889	3.14247	5.76489	8.79893	6.2%	17.5%	9.5%	26.7%
C64	PG 64-28	37.89423	1.90763	1.75524	2.38600	4.91468	6.68079	4.6%	13.0%	6.3%	17.6%
D	PG 70-28	5.01081	4.12138	2.43332	4.57528	6.81331	12.81078	48.6%	136.0%	91.3%	255.7%
D64	PG 70-28	19.69750	4.58745	1.81158	4.82002	5.07242	13.49604	9.2%	25.8%	24.5%	68.5%
E	PG 76-22	8.66763	5.19999	1.88139	5.42214	5.26790	15.18200	21.7%	60.8%	62.6%	175.2%

h

Critical Value = 2.63 2.63 2.63 2.63 2.63 2.63 2.63 2.63

Jnr (0.1 kPa)

Lab No.	Lab Name	Material						
		Binder A	Binder B	Binder C	Binder C64	Binder D	Binder D64	Binder E
1		0.35	0.37	0.21	-0.11	0.55	0.92	0.31
2		0.18	-0.47	-0.15	0.23	-0.06	-0.16	-0.20
3		0.49	0.48	-0.28	-0.88	0.26	0.19	-0.06
4		-2.01	-2.29	-1.64	-1.60	-0.95	-1.31	-1.56
5		-1.12	-1.36	-0.46		1.72		2.99
6		0.42	0.67	0.00		-0.46		0.72
7		0.14	-0.02	0.37		-0.03		0.99
8		-0.44	-0.94	0.54		-0.94		-0.06
9		-1.00	-0.92	-1.07	-1.07	-0.55	-0.98	-0.14
10		-0.75	-0.30	-0.59	0.10	0.19	-0.18	0.20
11		-0.18	0.31	-0.82	-0.29	-1.26	-1.09	-1.19
12		-0.28	0.07	-0.17	-0.25	0.03	0.40	0.25
13		-0.56	-0.05	-1.10	-1.14	-0.46	-0.55	0.10
14		-0.16	0.75	0.23	0.14	0.14	0.50	0.49
15		0.40	-0.61	0.11	-0.81	-0.08	-0.82	-0.48
16		1.83	1.45	1.15	1.07	0.70	0.60	0.75
17		1.58	1.17	0.01		-1.39		-1.96
18		-2.49	-2.54	-2.03	-1.49	-1.82	-2.25	-1.42
19		-0.42	-0.10	-0.96	-0.75	0.36	0.42	0.11
20		0.70	0.27	1.96	0.31	0.78	0.87	0.81
21		1.38	1.95	0.87	1.85	2.87	0.00	1.22
22		1.01	0.54	0.27	0.47	0.14	0.34	0.59
23		0.36	0.42	1.88	2.59	1.10	2.49	0.03
24		-0.26	0.05	-0.40	0.04	-0.32	-0.06	-0.63
25		1.16	0.81	2.07	0.66	1.20	1.27	0.26
26		0.21	0.65	0.09	0.39	-1.26	-0.51	-1.16
27		0.56	0.36	-0.18	0.61	-0.63	-0.37	-1.08
28		-1.10	-0.72	0.07	-0.05	0.19	0.30	0.10

exceeds h

exceeds h-0.5

h

Critical Value = 2.63

2.63 2.63 2.63 2.63 2.63 2.63 2.63 2.63

Jnr (3.2 kPa)

Lab No.	Lab Name	Material						
		Binder A	Binder B	Binder C	Binder C64	Binder D	Binder D64	Binder E
1		0.21	0.27	0.04	-0.18	0.71	0.83	0.22
2		0.05	-0.60	-0.36	0.13	-0.29	-0.54	-0.47
3		0.40	0.36	-0.28	-0.86	0.39	0.11	-0.25
4		-2.17	-2.35	-1.72	-2.09	-1.24	-1.53	-2.14
5		-1.22	-1.33	-1.00		1.66		2.79
6		0.27	0.54	1.00		0.64		0.59
7		0.40	0.53	0.22		-0.14		1.13
8		-0.61	-1.02	0.12		-1.24		-0.47
9		-0.99	-0.87	-1.09	-1.14	-0.73	-1.21	-0.31
10		-0.79	-0.33	-0.72	0.04	0.26	-0.34	0.10
11		-0.25	0.26	-0.84	-0.24	-1.20	-0.69	-0.95
12		-0.28	0.06	-0.22	-0.16	0.07	0.32	0.09
13		-0.67	-0.12	-1.14	-1.20	-0.71	-0.77	-0.21
14		-0.09	0.78	0.17	0.31	0.22	0.40	0.59
15		1.22	-0.06	0.72	0.22	0.75	0.17	0.47
16		1.70	1.51	0.97	1.45	0.95	0.40	0.84
17		1.55	1.21	0.34		-1.41		-1.70
18		-2.28	-2.60	-1.89	-1.61	-2.19	-2.18	-1.09
19		-0.54	-0.19	-0.86	-0.91	0.49	0.34	-0.05
20		0.57	0.15	1.87	0.53	1.14	0.95	1.06
21		1.32	1.84	0.69	1.99	0.00	0.00	1.37
22		0.97	0.61	0.32	0.85	0.13	0.33	0.50
23		0.26	0.30	1.76	0.00	1.55	2.58	0.03
24		-0.01	0.11	-0.38	0.35	-0.39	-0.18	-0.91
25		1.12	0.65	2.18	1.03	1.74	1.39	0.63
26		0.15	0.63	0.10	0.55	-0.97	-0.22	-0.72
27		0.59	0.40	-0.13	0.93	-0.29	-0.12	-0.99
28		-0.89	-0.74	0.09	0.00	0.08	-0.03	-0.16

exceeds h

exceeds h-0.5

h

Critical Value = 2.63

2.63 2.63 2.63 2.63 2.63 2.63 2.63

Recovery (0.1 kPa)

Lab No.	Lab Name	Material						
		Binder A	Binder B	Binder C	Binder C64	Binder D	Binder D64	Binder E
1		-0.33	0.11	-0.09	-0.04	-0.55	-0.73	-0.23
2		0.42	0.80	0.33	0.49	-0.06	0.03	0.04
3		-0.26	-0.12	0.43	0.90	-0.31	-0.12	-0.10
4		0.76	1.25	1.26	0.99	0.30	0.69	1.19
5		-0.10	0.32	-0.77		0.00		0.00
6		-2.41	-2.44	-2.61		-1.51		-1.66
7		1.42	0.79	-0.27		-0.02		-1.02
8		0.00	1.02	-0.94		0.65		-0.07
9		1.24	0.59	1.21	1.43	0.65	1.21	-0.38
10		0.42	0.32	0.25	-0.49	-0.54	-0.18	-0.71
11		-0.07	-0.02	0.42	-0.02	1.89	1.45	1.92
12		0.29	0.29	0.27	0.25	-0.27	-0.45	0.09
13		-0.07	0.00	0.98	1.07	0.45	0.58	0.09
14		0.79	0.68	0.06	-0.15	-0.95	-1.07	-0.83
15		-2.73	-2.61	-1.98	-1.57	-0.62	0.20	-0.11
16		0.14	0.47	-0.27	-0.33	-0.56	-0.47	-0.30
17								
18		1.06	-0.60	2.26	1.65	1.48	2.23	0.35
19		-0.05	0.07	0.90	0.45	-0.64	-0.64	-0.05
20		0.27	0.44	-0.31	0.42	-0.48	-0.35	-0.14
21		-0.52	-0.41	-0.68	-1.71	0.00	0.00	-0.81
22		0.53	0.73	0.51	0.34	-0.04	0.07	-0.22
23		0.25	0.41	-0.91	-1.50	-1.63	-2.23	-0.72
24		1.24	0.71	0.75	0.60	0.37	0.18	0.38
25		0.11	-0.15	-0.15	0.25	-0.75	-0.98	0.34
26		-0.27	-0.10	-0.02	-0.42	2.10	0.96	2.25
27		-0.18	-0.10	0.27	-0.44	1.83	0.79	2.32
28		-1.97	-2.45	-0.90	-2.17	-0.81	-1.18	-1.58

exceeds h

exceeds h-0.5

h

Critical Value = 2.63

2.63 2.63 2.63 2.63 2.63 2.63 2.63

Recovery (3.2 kPa)

Lab No.	Lab Name	Material						
		Binder A	Binder B	Binder C	Binder C64	Binder D	Binder D64	Binder E
1		-0.73	-0.53	-0.10	-0.14	-0.61	-0.66	-0.08
2		0.58	1.66	0.60	0.96	0.68	0.70	0.10
3		-0.72	-0.56	0.20	0.22	-0.17	0.02	0.18
4		1.50	1.42	1.48	1.32	0.70	1.22	1.95
5		0.99	0.83	0.83		0.00		0.00
6		-1.47	-1.66	-2.81		-1.44		-1.04
7		-0.79	0.33	-0.29		0.34		-1.30
8		1.13	1.05	0.13		1.15		0.70
9		1.06	0.99	1.11	1.00	0.95	1.54	-0.26
10		-0.17	-0.28	0.39	-0.41	-0.49	0.19	-0.65
11		-0.79	-0.83	0.38	-0.17	1.40	0.68	1.19
12		-0.45	-0.39	0.14	-0.09	-0.15	-0.34	0.41
13		-0.45	-0.50	0.85	0.30	0.89	0.97	0.67
14		1.27	0.66	0.07	0.61	-0.83	-0.78	-1.04
15		-1.47	-1.66	0.00	-2.56	-1.58	-1.20	-1.85
16		0.82	0.55	-0.35	0.45	-0.93	-0.34	-0.25
17								
18		-0.04	0.94	1.85	0.96	1.65	2.09	1.09
19		-0.45	-0.44	0.69	0.14	-0.57	-0.48	0.23
20		1.06	0.81	-0.70	0.70	-0.71	-0.63	-0.45
21		-0.93	-1.00	-0.50	-0.99	0.00	0.00	-0.91
22		0.99	0.83	0.13	0.65	0.09	0.08	0.00
23		1.11	0.74	-0.84	-0.08	-1.79	-2.36	-0.97
24		1.06	0.72	0.56	0.65	0.59	0.41	0.70
25		0.54	0.36	-0.98	0.31	-1.18	-1.25	-0.34
26		-0.72	-0.94	-0.38	-0.37	1.17	0.31	1.22
27		-1.47	-1.44	-0.35	-0.91	1.12	0.13	1.97
28		-1.47	-1.66	-2.10	-2.56	-0.28	-0.31	-1.28

exceeds h

exceeds h-0.5

h

Critical Value = 2.63

2.63 2.63 2.63 2.63 2.63 2.63 2.63

Jnr-Diff

Lab No.	Lab Name	Material						
		Binder A	Binder B	Binder C	Binder C64	Binder D	Binder D64	Binder E
1		-0.88	-0.73	-0.74	-0.83	-0.22	0.14	-0.34
2		-0.79	-1.08	-1.10	-1.57	-1.22	-1.36	-0.60
3		-0.60	-1.10	0.22	1.17	-0.33	-0.13	-0.49
4		-0.57	0.18	-0.88	-0.87	-0.87	-1.50	-0.93
5		-0.94	-1.06	0.00		-1.11		-0.92
6		-0.20	-0.34	-1.29		-0.38		-0.56
7		1.47	2.04	-0.52		-0.64		-0.06
8		-0.89	0.29	-2.04		-0.86		-1.00
9		0.33	1.52	-0.11	0.96	-0.77	-1.32	-0.40
10		-0.10	0.14	-0.78	-1.13	-0.25	-0.63	-0.30
11		-0.37	-0.03	-0.03	0.26	1.20	1.21	1.36
12		0.08	0.43	-0.07	0.41	-0.36	-0.01	-0.50
13		-0.50	-0.20	-0.23	1.17	-0.97	-1.04	-0.79
14		0.43	0.78	-0.03	0.13	-0.24	-0.03	0.03
15		3.30	0.00	3.47	0.00	2.86	0.00	2.85
16		-0.60	1.10	-0.47	-0.19	-0.06	-0.37	-0.09
17		0.34	-0.65	-0.32		0.75		2.01
18		1.24	-1.18	0.76	1.61	-0.35	-0.90	-1.10
19		-0.61	-0.58	0.75	-0.27	-0.24	0.03	-0.45
20		-0.84	-1.09	0.18	0.15	0.26	0.68	0.26
21		-0.56	-0.89	-0.56	-2.53	0.85	2.41	-0.15
22		-0.43	1.49	0.70	0.80	-0.40	0.17	-0.50
23		-0.68	-1.00	0.06	-0.61	0.28	1.19	0.00
24		1.46	1.48	0.40	1.18	-0.41	-0.34	-0.45
25		-0.45	-1.42	1.20	0.41	0.62	0.93	0.82
26		-0.41	0.25	0.38	-0.32	2.27	0.94	2.07
27		0.03	1.15	0.61	0.27	1.52	0.87	0.89
28		1.71	0.52	0.43	-0.20	-0.93	-0.93	-0.67

exceeds h

exceeds h-0.5

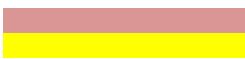
k

Critical Value = 2.23

2.23 2.23 2.23 2.23 2.23 2.23 2.23

Jnr (0.1 kPa)

Lab No.	Lab Name	Material						
		Binder A	Binder B	Binder C	Binder C64	Binder D	Binder D64	Binder E
1		0.48	0.10	0.06	0.74	0.18	0.51	0.13
2		0.16	0.28	0.40	0.54	0.00	0.66	0.00
3		0.40	0.35	0.44	0.13	0.00	0.11	0.45
4		0.53	0.55	0.14	0.28	0.37	0.34	0.32
5		0.14	0.13	0.21		0.33		0.81
6		0.46	0.60	0.00		3.82		0.97
7		1.37	2.93	0.77		1.06		1.23
8		2.31	0.57	1.16		0.00		0.63
9		1.01	0.18	0.10	0.12	0.57	0.67	0.15
10		0.72	0.76	0.63	0.61	0.37	1.63	1.57
11		0.52	0.48	0.94	0.61	0.42	1.16	0.25
12		0.73	0.61	0.16	0.97	0.40	0.23	0.50
13		0.56	0.54	0.03	0.08	0.40	0.24	0.26
14		0.33	0.56	0.51	0.38	0.18	0.84	0.35
15		1.42	3.04	1.85	2.22	0.09	0.79	0.55
16		0.41	0.58	0.60	0.66	0.58	2.07	0.53
17		0.79	0.00	3.12		1.80		1.14
18		0.77	1.37	1.37	2.28	0.74	0.30	4.10
19		0.09	0.29	0.57	0.82	1.06	1.29	0.41
20		0.22	0.27	1.25	1.64	0.32	1.50	0.92
21		0.66	0.29	0.96	0.99	0.75	0.00	0.21
22		0.42	0.18	0.30	0.04	0.24	0.59	0.45
23		0.39	0.47	0.67	1.31	0.09	0.60	0.51
24		0.38	0.55	1.13	0.85	0.64	0.23	0.40
25		1.95	1.07	1.13	0.74	1.89	2.11	0.63
26		0.24	0.25	0.70	0.39	0.32	0.46	0.49
27		0.60	1.28	0.98	1.22	0.48	0.37	0.30
28		2.91	1.14	0.63	0.83	0.84	1.19	0.28


 exceeds k
 exceeds k-0.5

k

Critical Value = 2.23

2.23 2.23 2.23 2.23 2.23 2.23 2.23

Jnr (3.2 kPa)

Lab No.	Lab Name	Material						
		Binder A	Binder B	Binder C	Binder C64	Binder D	Binder D64	Binder E
1		0.41	0.03	0.11	0.59	0.22	0.55	0.27
2		0.08	0.45	0.52	0.64	0.00	0.43	0.00
3		0.20	0.27	0.26	0.12	0.12	0.16	0.58
4		0.33	0.40	0.33	0.20	0.50	0.05	0.39
5		0.18	0.02	0.26		0.67		1.70
6		0.83	0.67	0.87		1.88		1.12
7		0.83	1.30	0.66		1.25		1.57
8		2.39	0.38	1.11		0.36		0.46
9		0.89	0.07	0.35	0.27	0.75	0.52	0.22
10		0.59	0.91	0.81	0.50	0.67	1.45	2.43
11		0.62	0.47	1.04	0.36	0.64	1.40	0.63
12		0.48	0.69	0.14	0.97	0.52	0.26	0.70
13		0.54	0.54	0.06	0.03	0.64	0.28	0.41
14		0.73	0.88	0.64	0.46	0.00	0.72	0.46
15		1.10	3.61	2.59	2.80	0.32	0.59	1.12
16		0.66	0.93	0.72	0.54	0.72	2.10	0.83
17		1.61	0.64	0.00		2.99		2.22
18		0.94	1.82	1.90	2.32	1.26	0.13	0.54
19		0.12	0.37	1.11	0.79	1.48	0.92	0.66
20		0.30	0.32	1.45	1.52	1.07	1.68	1.51
21		0.86	0.23	1.64	0.85	0.00	0.00	0.38
22		0.24	0.17	0.34	0.18	0.52	0.41	0.85
23		0.64	0.41	0.83	0.00	0.55	0.22	1.26
24		0.43	0.76	0.85	0.60	0.73	0.15	0.48
25		2.37	0.57	1.25	0.74	1.32	2.48	0.51
26		0.29	0.29	0.71	0.27	0.52	0.63	0.13
27		0.72	1.18	1.12	1.04	0.21	0.52	0.63
28		2.26	1.47	1.02	0.59	1.15	0.98	0.34

exceeds k

exceeds k-0.5

k

Critical Value = 2.23

2.23 2.23 2.23 2.23 2.23 2.23 2.23

Recovery (0.1 kPa)

Lab No.	Lab Name	Material						
		Binder A	Binder B	Binder C	Binder C64	Binder D	Binder D64	Binder E
1		0.24	0.35	0.04	0.67	0.52	0.44	0.40
2		0.00	0.80	0.00	0.00	0.00	1.40	0.00
3		0.30	0.28	1.08	0.17	0.21	0.14	0.82
4		1.40	0.52	0.65	0.27	0.31	1.24	0.12
5		0.56	0.00	0.64		0.00		0.00
6		0.00	0.56	0.00		0.85		2.63
7		1.80	3.23	1.86		1.02		0.83
8		1.13	0.98	1.51		0.56		0.48
9		0.37	2.48	0.58	0.54	0.56	0.14	0.16
10		0.42	0.14	0.44	0.51	0.21	1.62	1.42
11		0.34	0.44	0.59	0.67	1.23	1.26	0.36
12		0.53	0.08	0.28	0.81	0.39	0.24	0.24
13		0.24	0.71	0.28	0.17	0.70	0.37	0.36
14		0.37	0.72	0.36	0.35	0.11	0.37	0.33
15		0.00	0.00	1.40	2.23	0.32	0.35	0.71
16		0.40	0.28	0.75	0.35	1.74	1.63	0.60
17								
18		3.86	0.10	2.02	3.20	1.60	1.43	3.37
19		0.17	0.16	0.28	0.45	0.19	1.46	0.24
20		0.02	0.36	0.38	1.04	0.89	1.49	0.40
21		0.30	0.15	0.17	0.67	0.00	0.00	0.16
22		0.15	0.08	0.17	0.17	0.77	0.70	0.55
23		0.07	0.14	0.90	0.79	0.25	0.61	0.07
24		0.69	0.76	2.23	0.86	1.31	0.42	0.74
25		0.89	2.38	0.77	0.79	3.21	0.64	0.69
26		0.02	0.16	1.07	0.46	0.49	0.98	0.96
27		0.06	0.29	0.86	0.76	0.70	0.98	0.16
28		1.30	0.42	1.40	0.85	0.31	1.08	0.30

exceeds k

exceeds k-0.5

k

Critical Value = 2.23

2.23 2.23 2.23 2.23 2.23 2.23 2.23

Recovery (3.2 kPa)

Lab No.	Lab Name	Material						
		Binder A	Binder B	Binder C	Binder C64	Binder D	Binder D64	Binder E
1		0.21	0.05	0.12	1.28	1.05	0.61	0.56
2		0.00	0.00	0.00	0.00	0.00	0.87	0.98
3		0.41	0.19	0.68	0.36	0.57	0.15	0.93
4		0.03	0.04	0.14	0.36	0.23	0.51	0.10
5		0.00	0.00	0.56		0.00		0.00
6		0.00	0.00	1.81		2.06		1.28
7		0.81	3.97	0.63		1.32		0.71
8		0.41	0.19	0.85		0.33		0.49
9		2.26	3.12	1.24	2.16	0.55	0.44	0.34
10		0.41	0.19	0.78	0.71	0.50	1.72	1.96
11		0.81	0.33	1.29	0.94	0.90	1.72	0.71
12		0.70	0.19	0.32	1.23	0.63	0.09	0.26
13		0.00	0.00	0.12	0.36	1.00	0.46	0.45
14		0.39	0.00	0.56	0.62	0.33	0.38	0.34
15		0.00	0.00	0.00	0.00	0.32	0.28	1.37
16		0.11	0.02	0.48	0.48	0.43	1.66	0.77
17								
18		4.28	0.94	2.96	1.07	1.69	0.38	3.18
19		0.00	0.19	0.88	1.07	0.57	1.14	0.35
20		0.12	0.04	0.57	1.66	2.25	2.16	0.42
21		0.41	0.00	0.92	1.28	0.00	0.00	0.10
22		0.00	0.00	0.42	0.36	0.88	0.70	0.80
23		0.20	0.03	0.28	1.09	0.47	0.24	0.69
24		0.41	0.19	1.50	0.36	1.20	0.49	0.69
25		0.22	0.08	0.32	1.74	1.32	1.82	0.40
26		0.81	0.50	0.85	0.36	1.33	0.71	0.34
27		0.00	0.19	1.18	1.23	0.25	0.68	1.36
28		0.00	0.00	0.95	0.00	0.18	0.35	0.05

exceeds k

exceeds k-0.5

k

Critical Value = 2.23

2.23 2.23 2.23 2.23 2.23 2.23 2.23

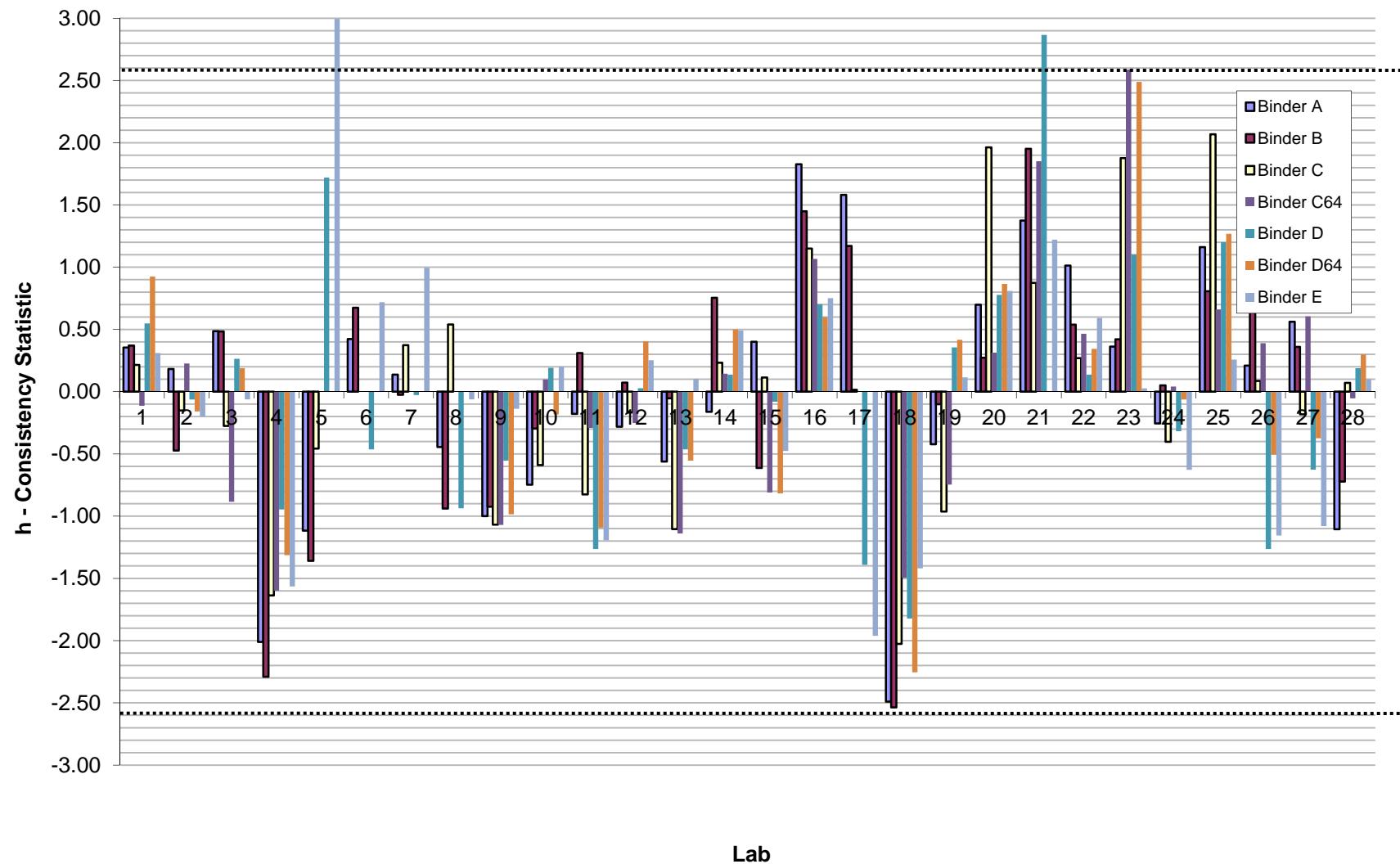
Jnr-Diff

Lab No.	Lab Name	Material						
		Binder A	Binder B	Binder C	Binder C64	Binder D	Binder D64	Binder E
1		0.26	0.37	0.12	0.45	0.04	0.45	0.22
2		0.17	0.63	0.69	0.91	0.00	0.19	0.00
3		0.45	0.31	1.12	0.50	0.18	0.29	0.10
4		1.41	0.78	0.67	0.35	0.56	0.96	0.18
5		0.31	0.91	0.00		0.00		1.06
6		0.19	1.22	0.00		0.66		2.36
7		1.97	2.75	1.33		0.39		0.74
8		1.16	0.63	0.86		0.74		1.41
9		0.66	0.31	0.80	0.72	0.11	0.52	0.26
10		0.43	0.24	0.29	0.34	0.21	0.79	0.49
11		0.43	0.54	0.33	0.94	2.29	1.72	0.93
12		0.65	0.12	0.18	1.07	0.09	0.27	0.09
13		0.18	0.57	0.28	0.27	0.20	0.40	0.22
14		0.97	0.74	0.14	1.01	0.18	0.29	0.12
15		0.97	0.00	0.55	0.00	0.38	0.00	0.56
16		0.61	0.79	0.47	1.26	0.20	1.58	0.89
17		1.87	0.19	0.17		1.34		1.21
18		1.78	3.01	2.18	3.31	2.08	0.85	0.38
19		0.13	0.23	1.42	0.16	0.25	0.16	0.12
20		0.15	0.09	0.24	0.38	1.21	1.46	0.92
21		0.36	0.27	1.54	0.31	0.25	0.18	0.11
22		0.68	0.26	0.27	0.73	0.20	0.24	0.80
23		0.79	0.58	2.26	1.19	0.75	0.55	1.34
24		1.35	0.63	1.74	0.91	0.33	0.09	0.27
25		0.82	1.57	0.55	0.22	2.25	2.11	1.38
26		0.09	0.09	0.68	0.59	2.28	2.12	1.84
27		0.16	0.66	0.39	0.51	1.06	1.02	2.43
28		2.53	0.76	1.22	0.79	0.30	0.90	0.33

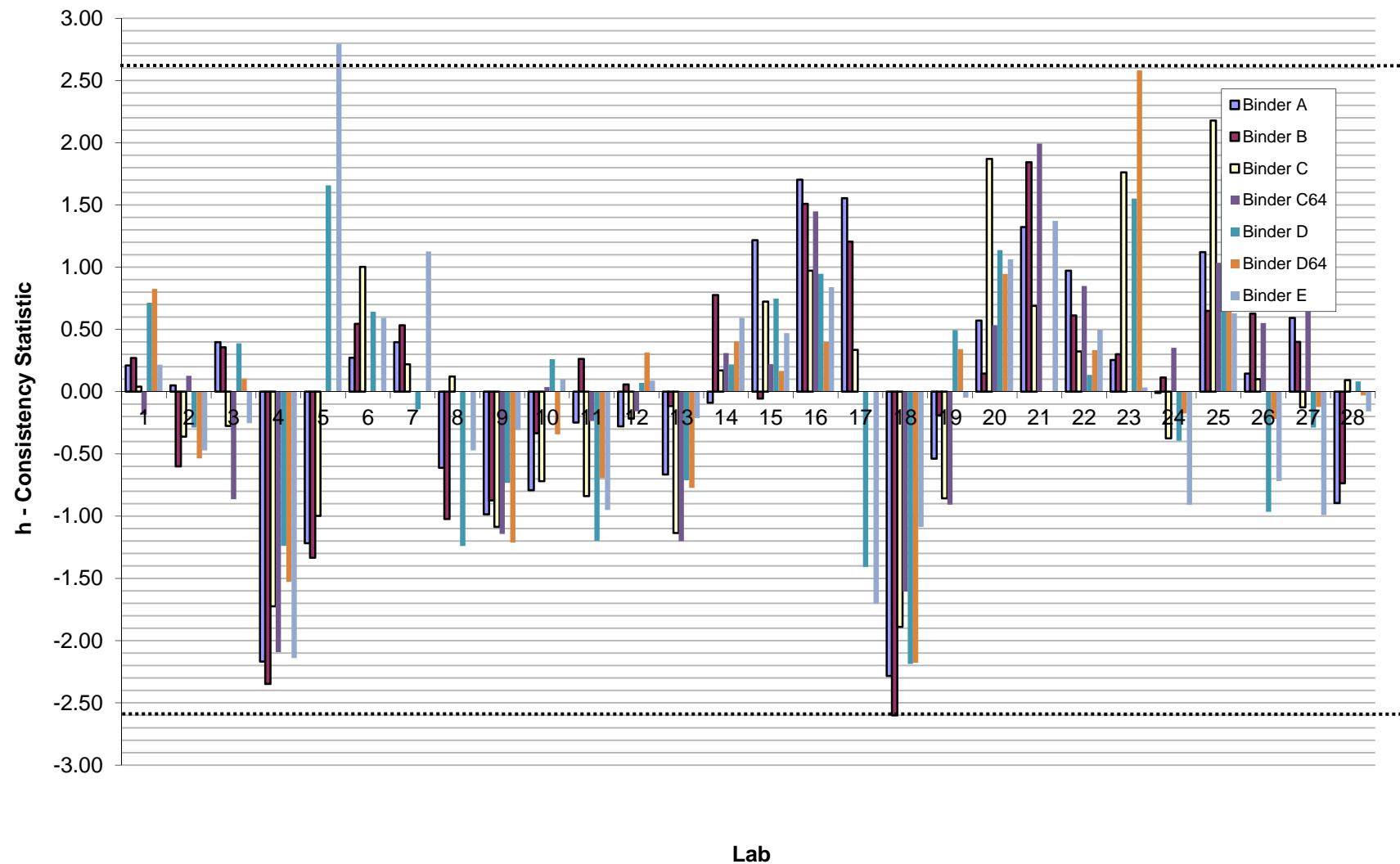
exceeds k

exceeds k-0.5

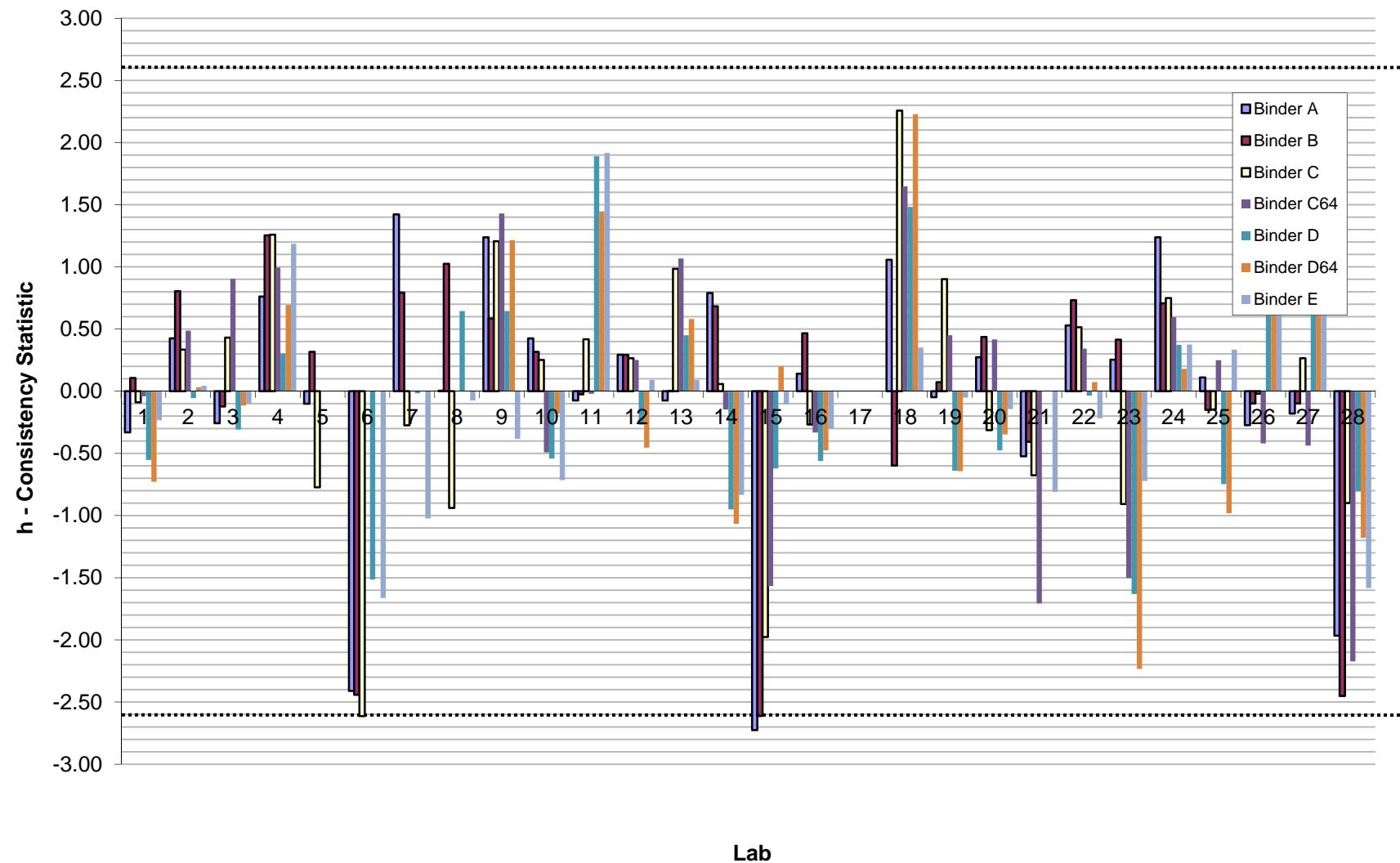
Jnr (0.1 kPa): h - Materials within Laboratories



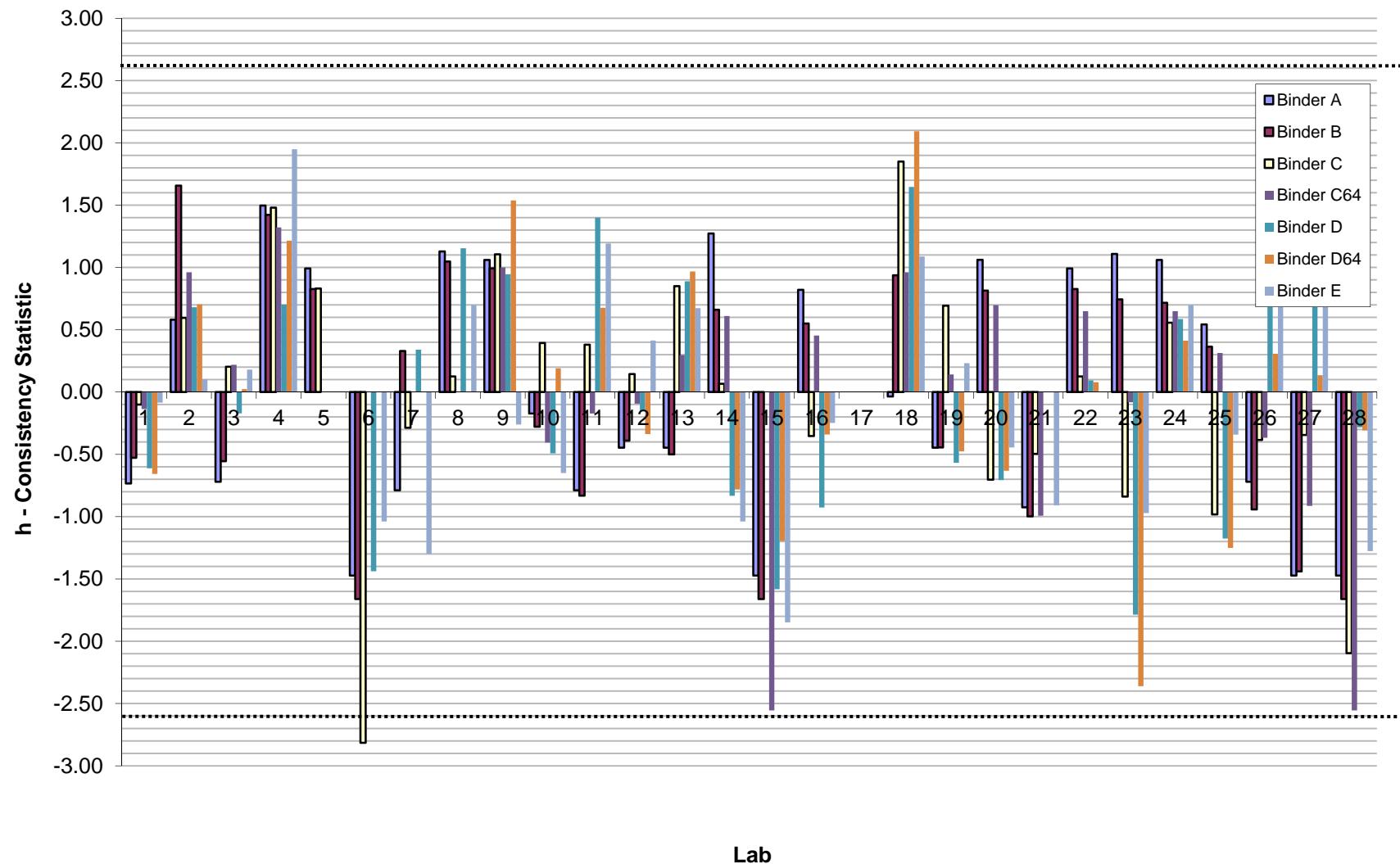
Jnr (3.2 kPa): h - Materials within Laboratories



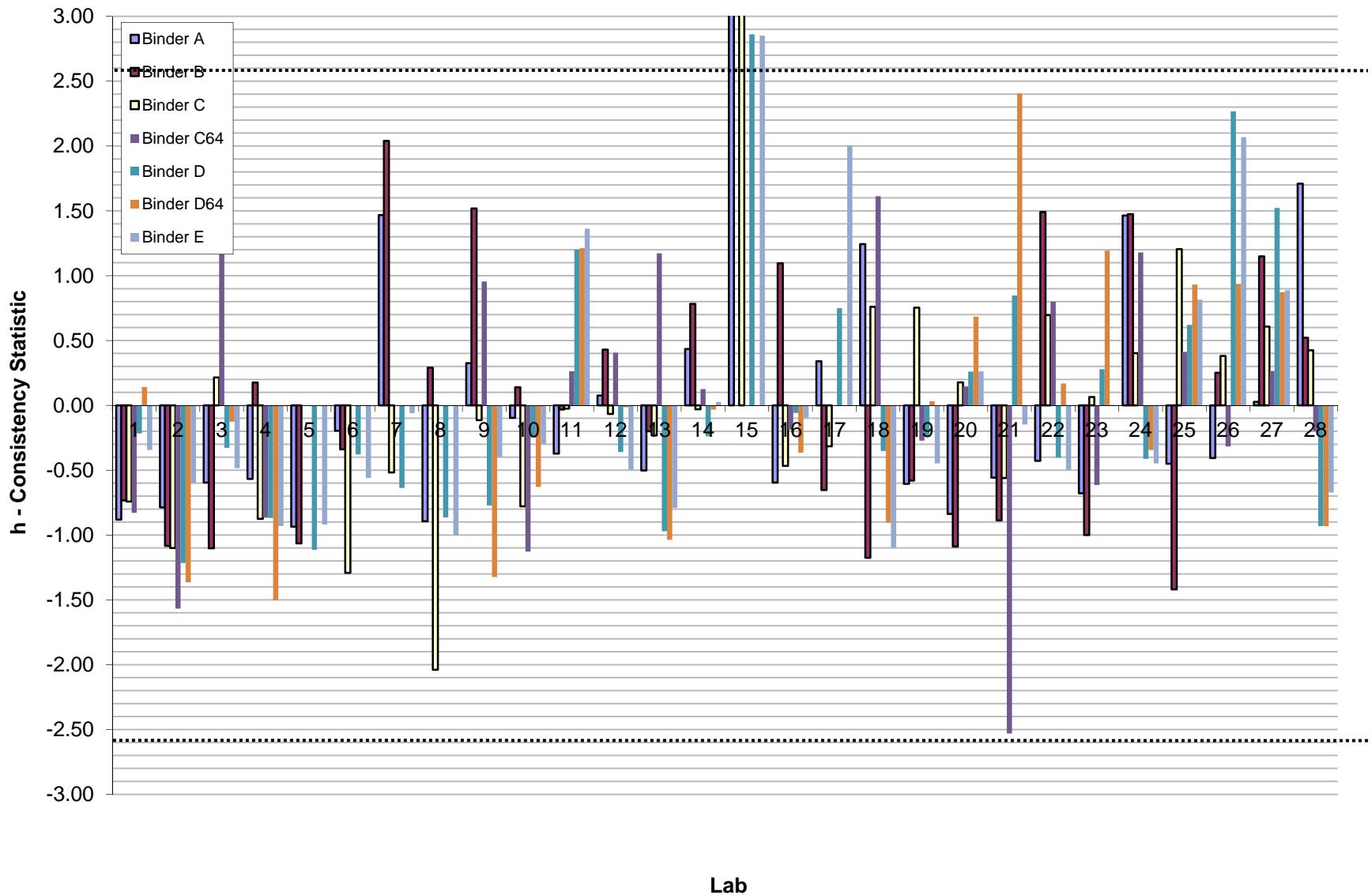
Recovery (0.1 kPa): h - Materials within Laboratories



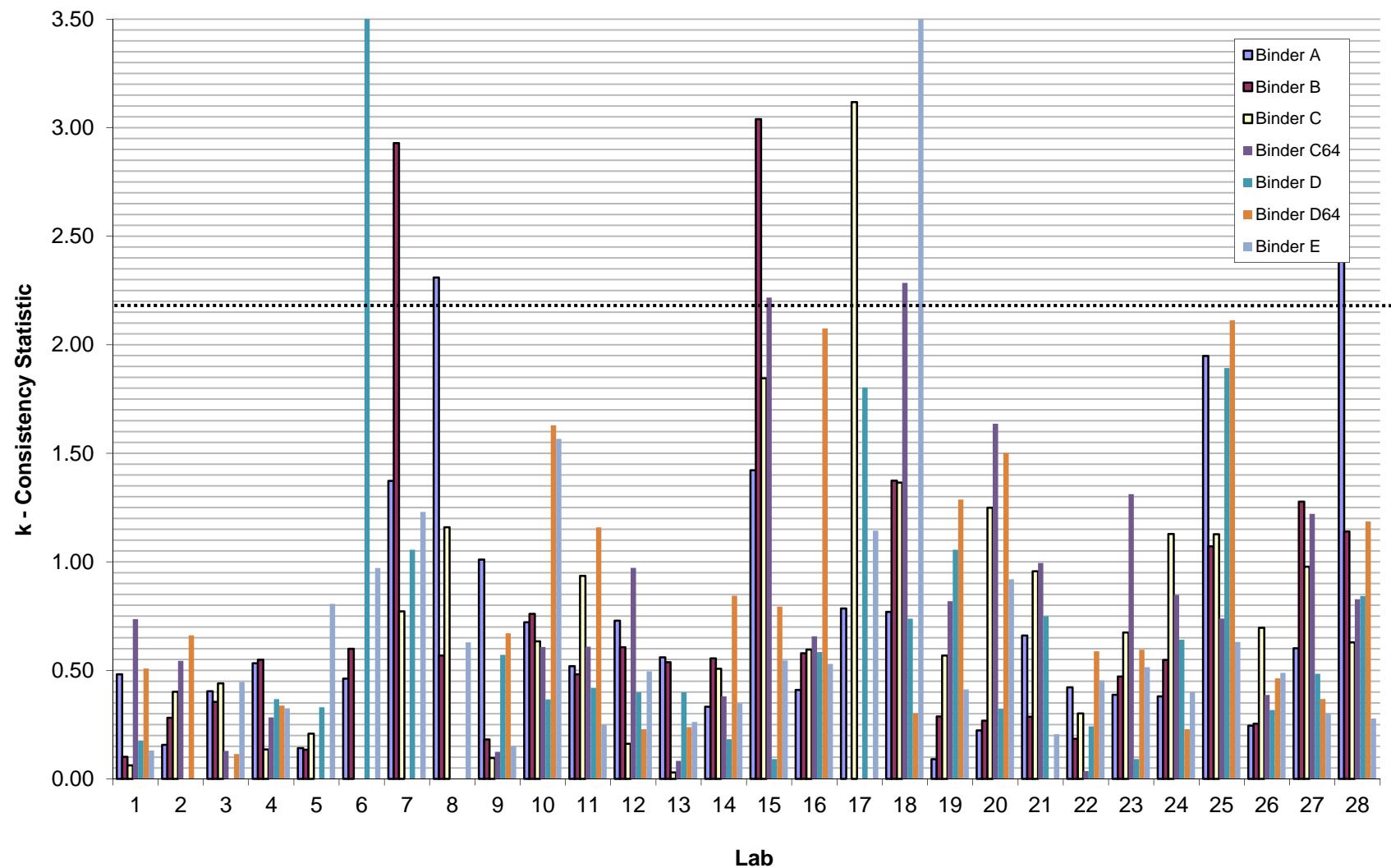
Recovery (3.2 kPa): h - Materials within Laboratories



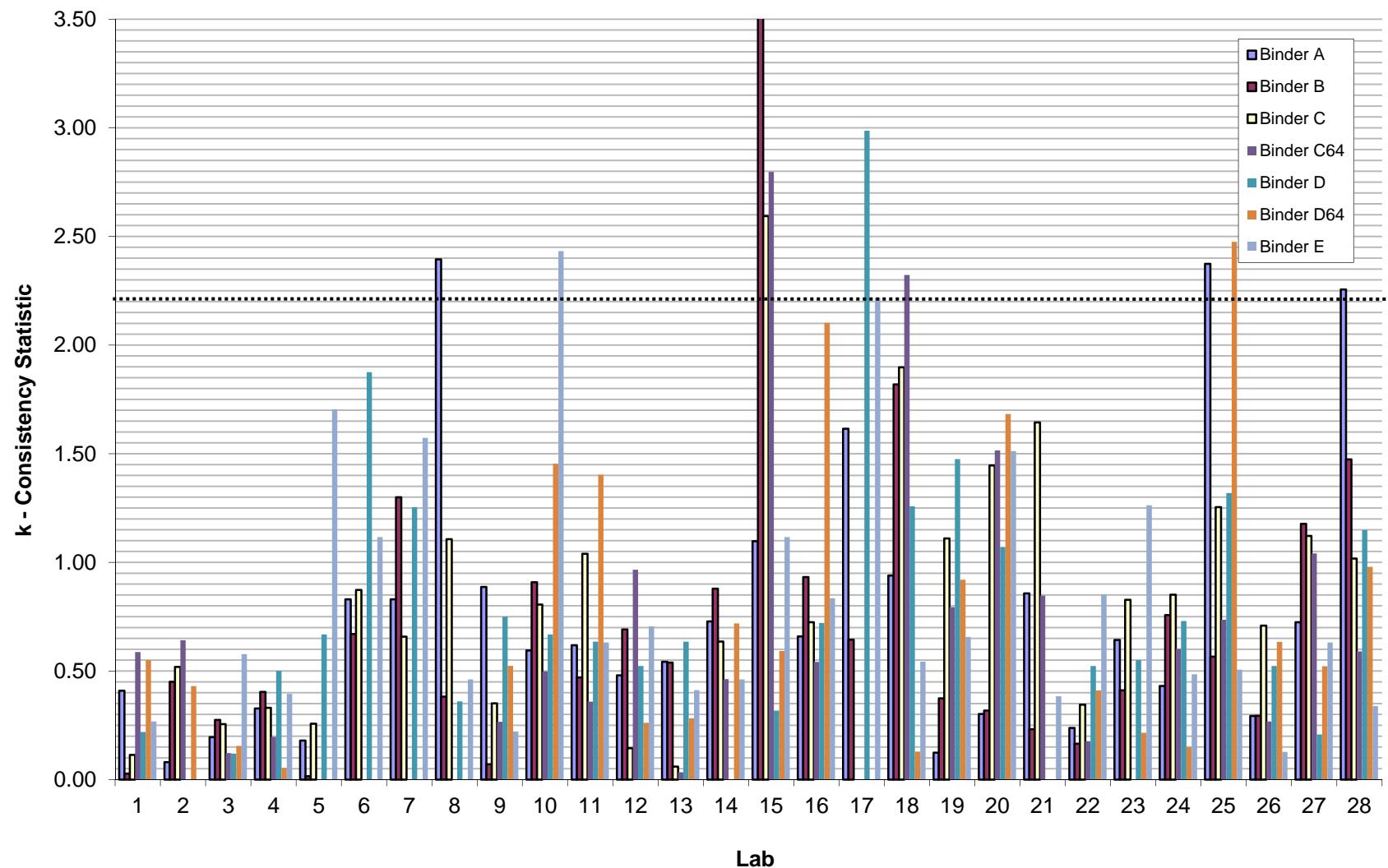
Jnr-Diff: h - Materials within Laboratories



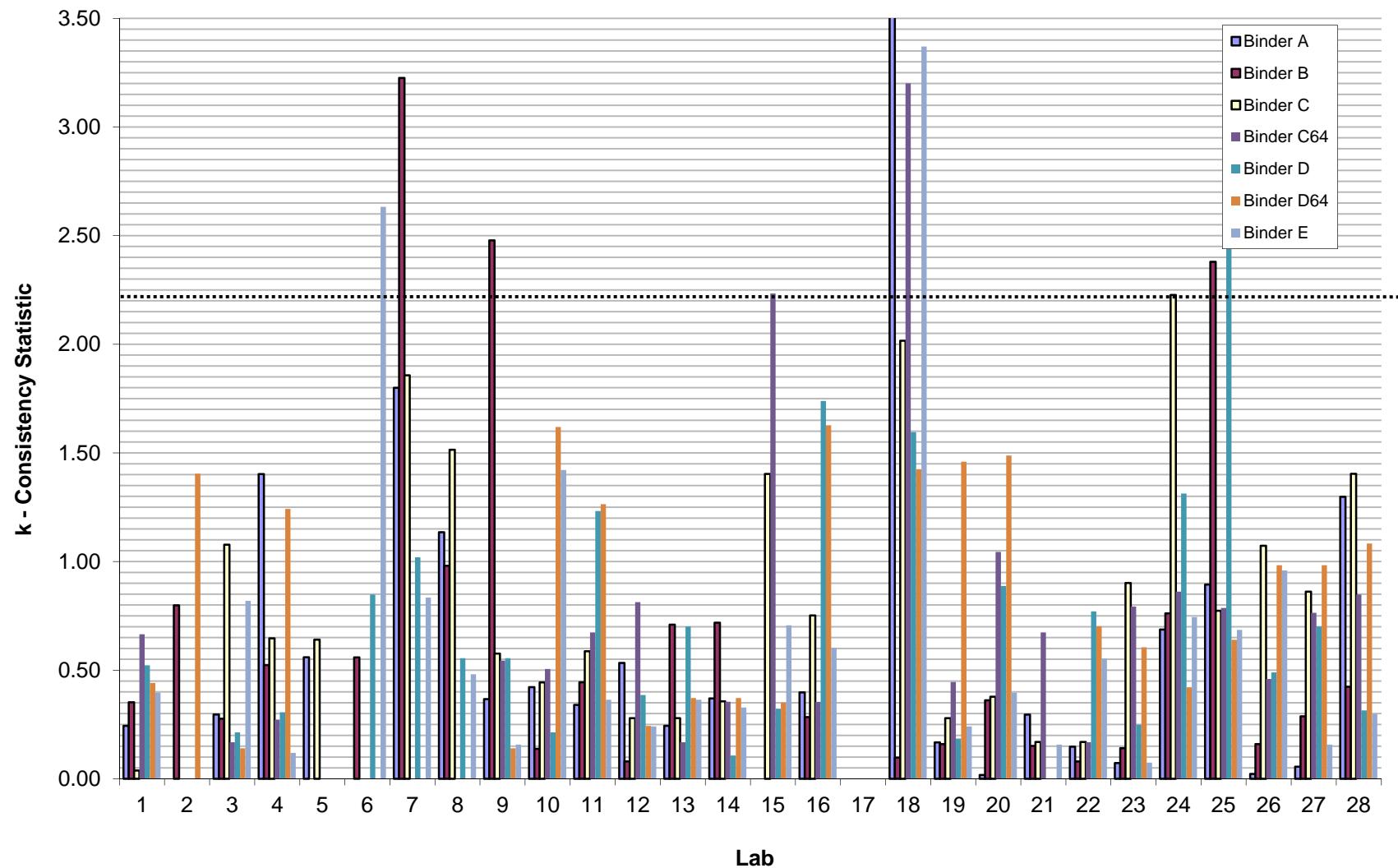
Jnr (0.1 kPa): k - Materials within Laboratories



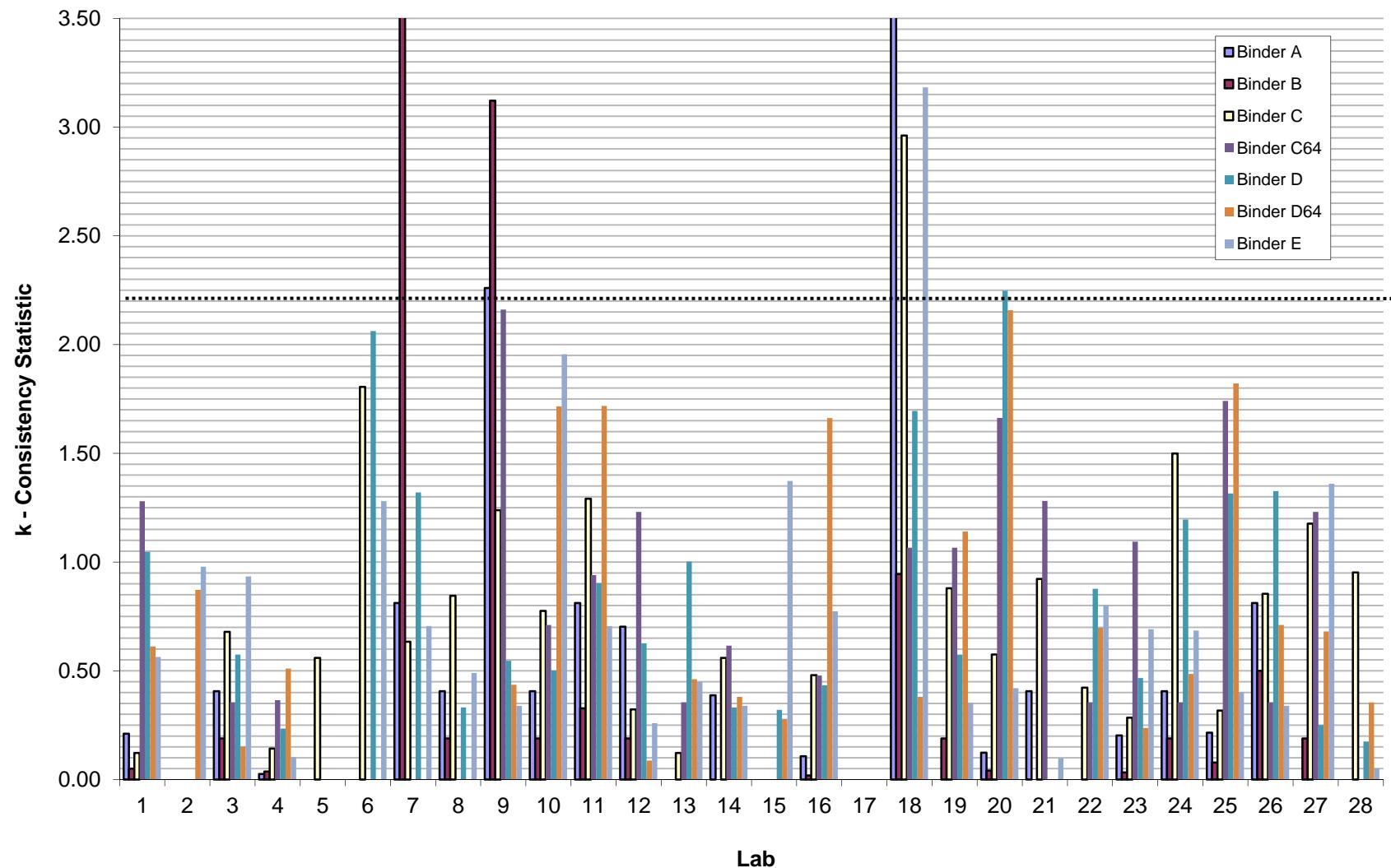
Jnr (3.2 kPa): k - Materials within Laboratories



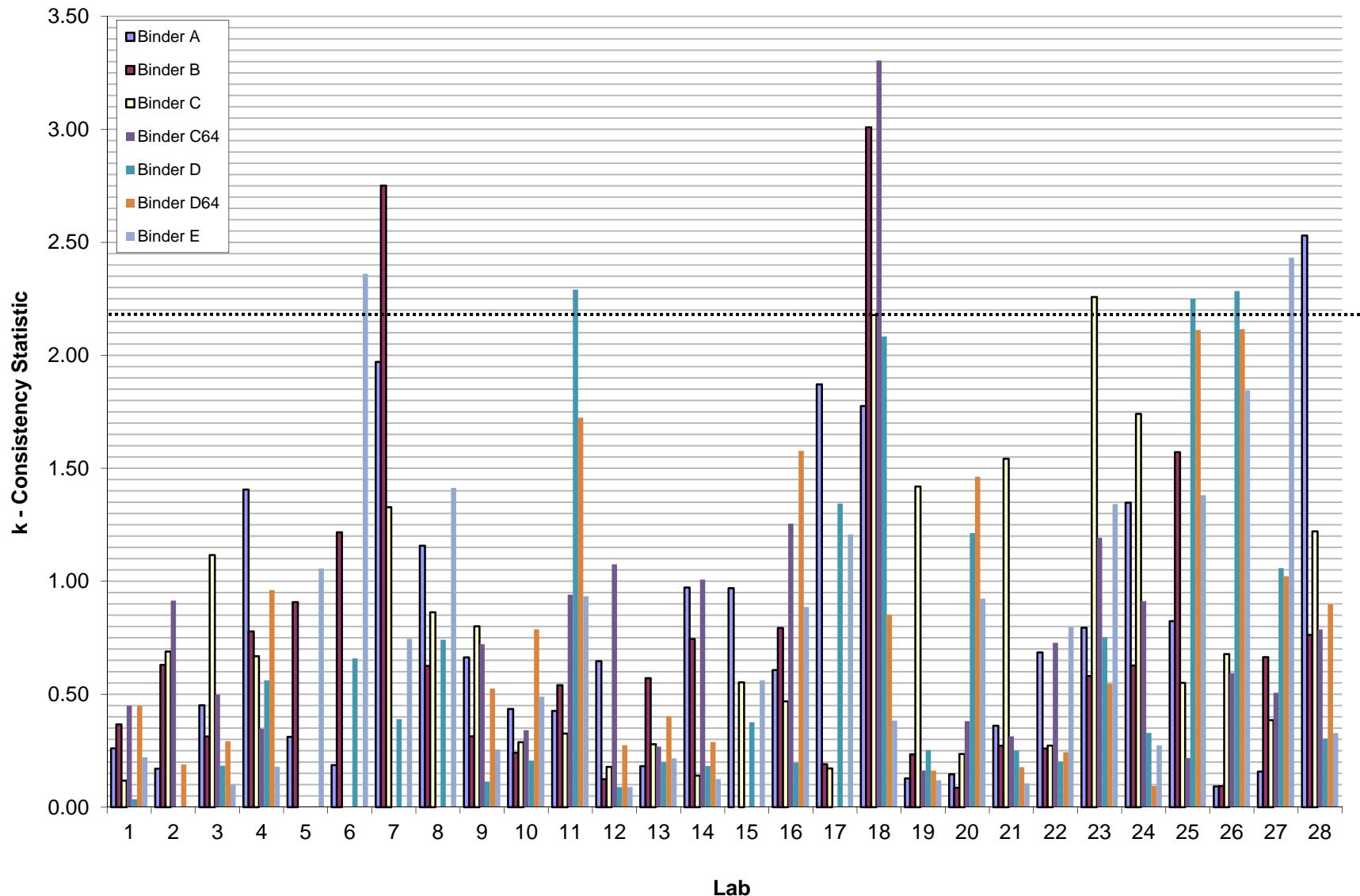
Recovery (0.1 kPa): k - Materials within Laboratories



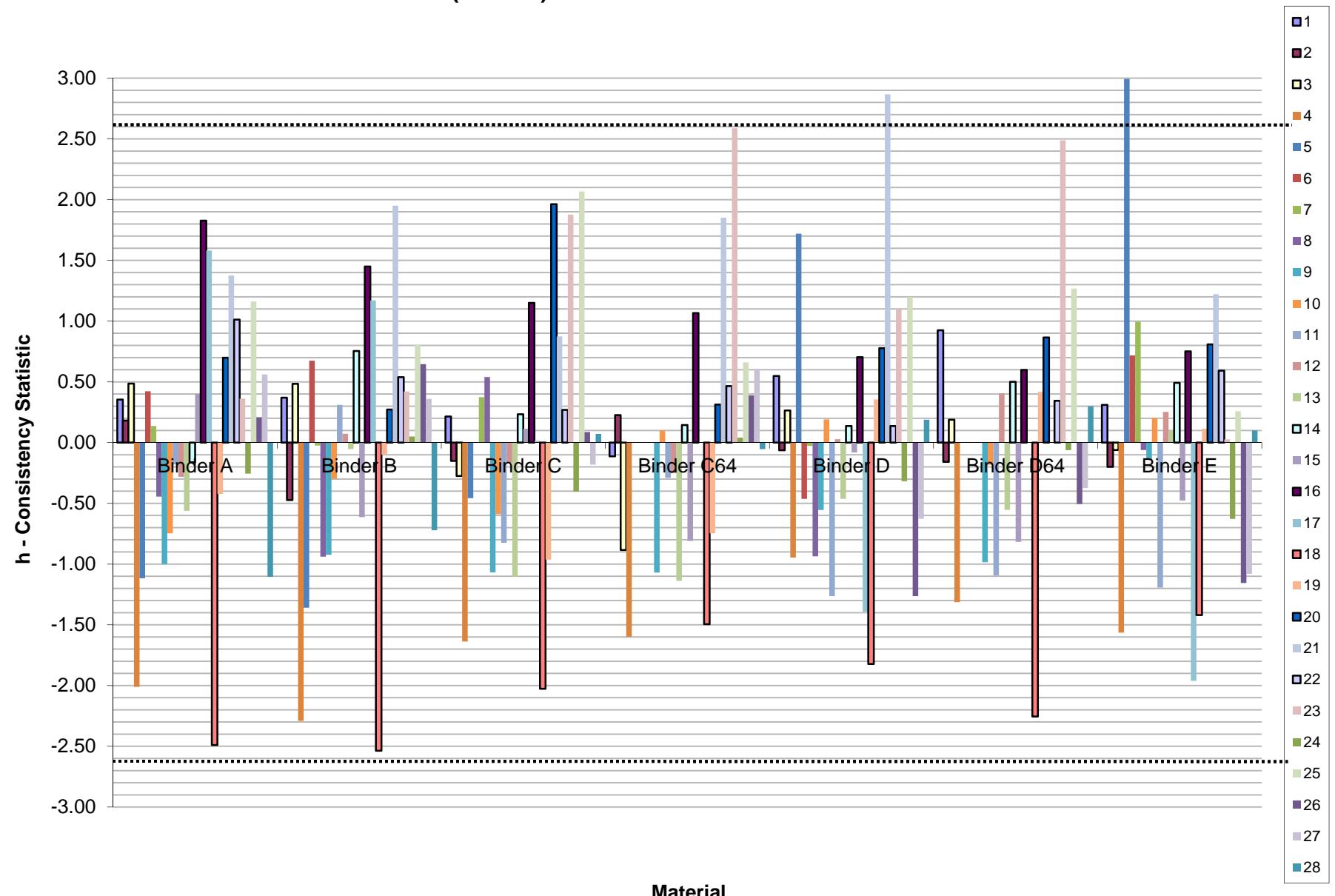
Recovery (3.2 kPa): k - Materials within Laboratories



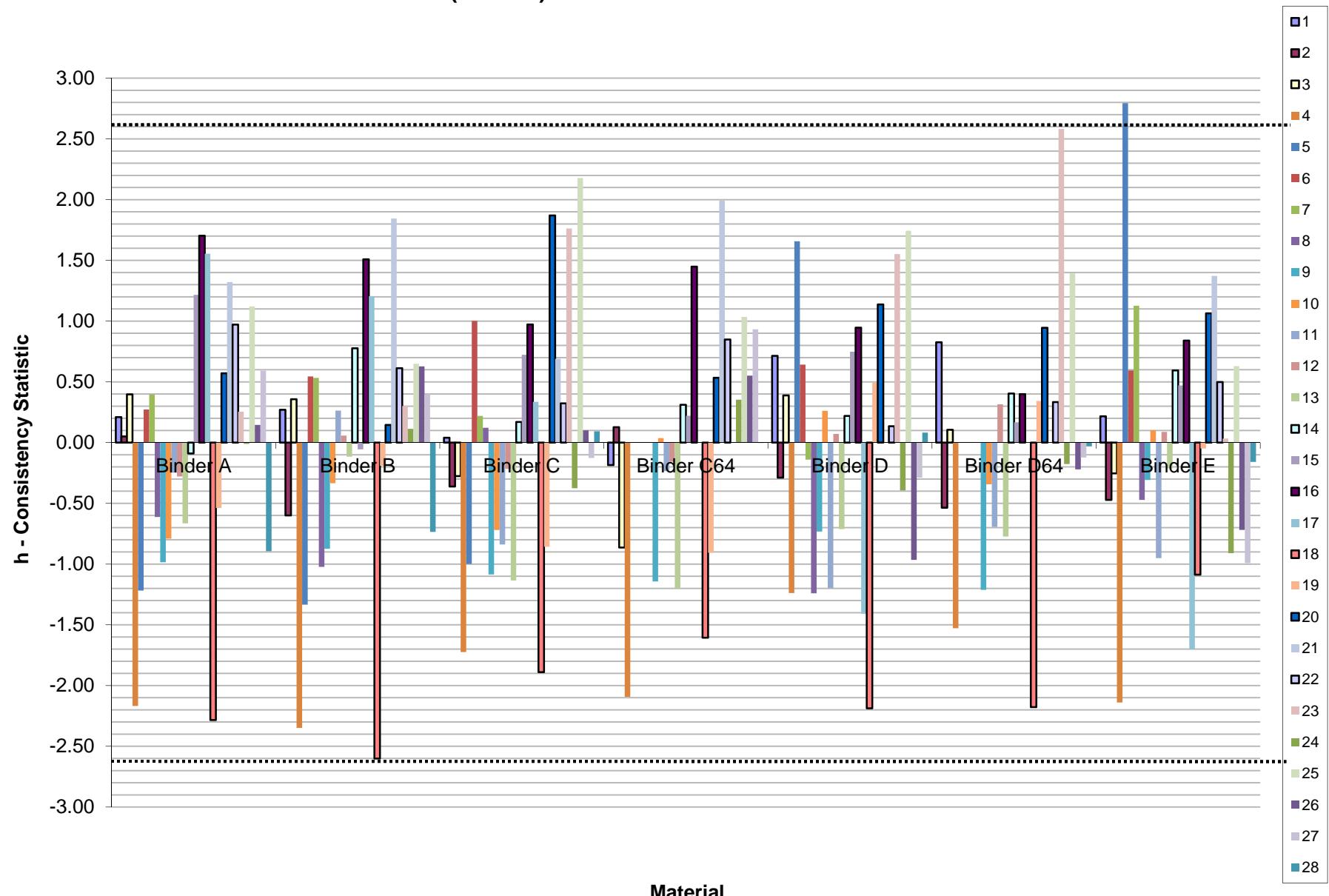
Jnr-Diff: k - Materials within Laboratories



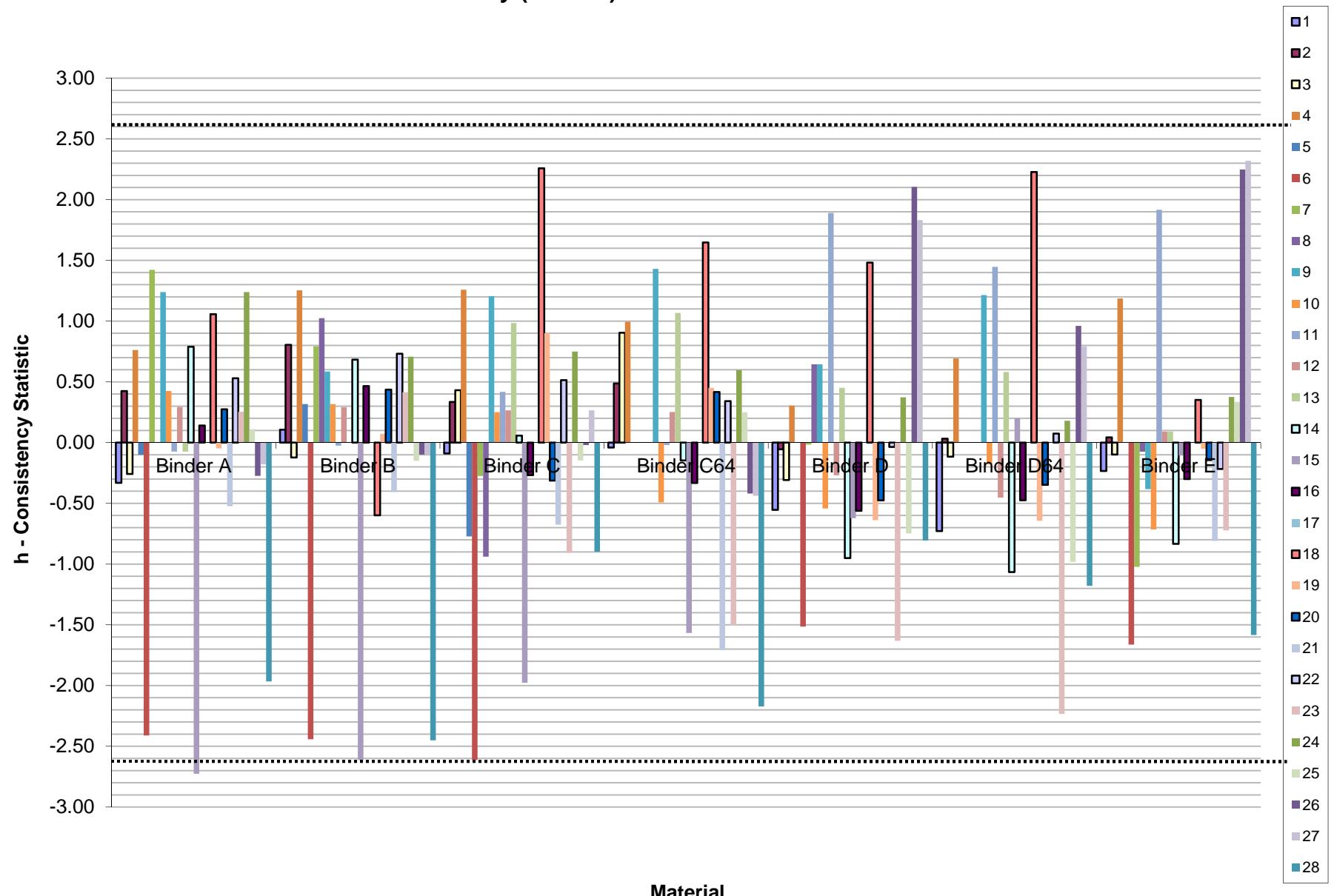
Jnr (0.1 kPa): h - Laboratories within Materials



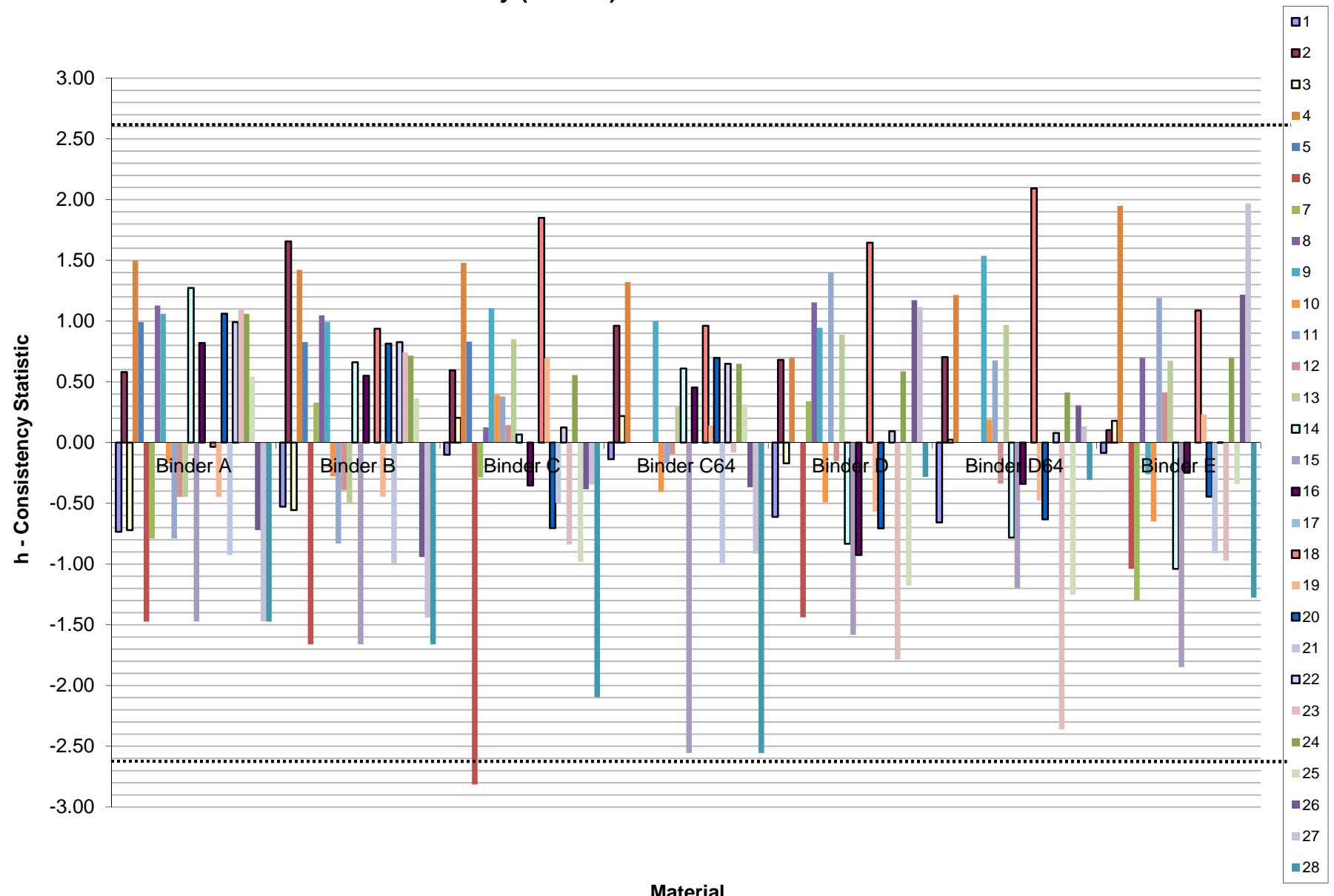
Jnr (3.2 kPa): h - Laboratories within Materials



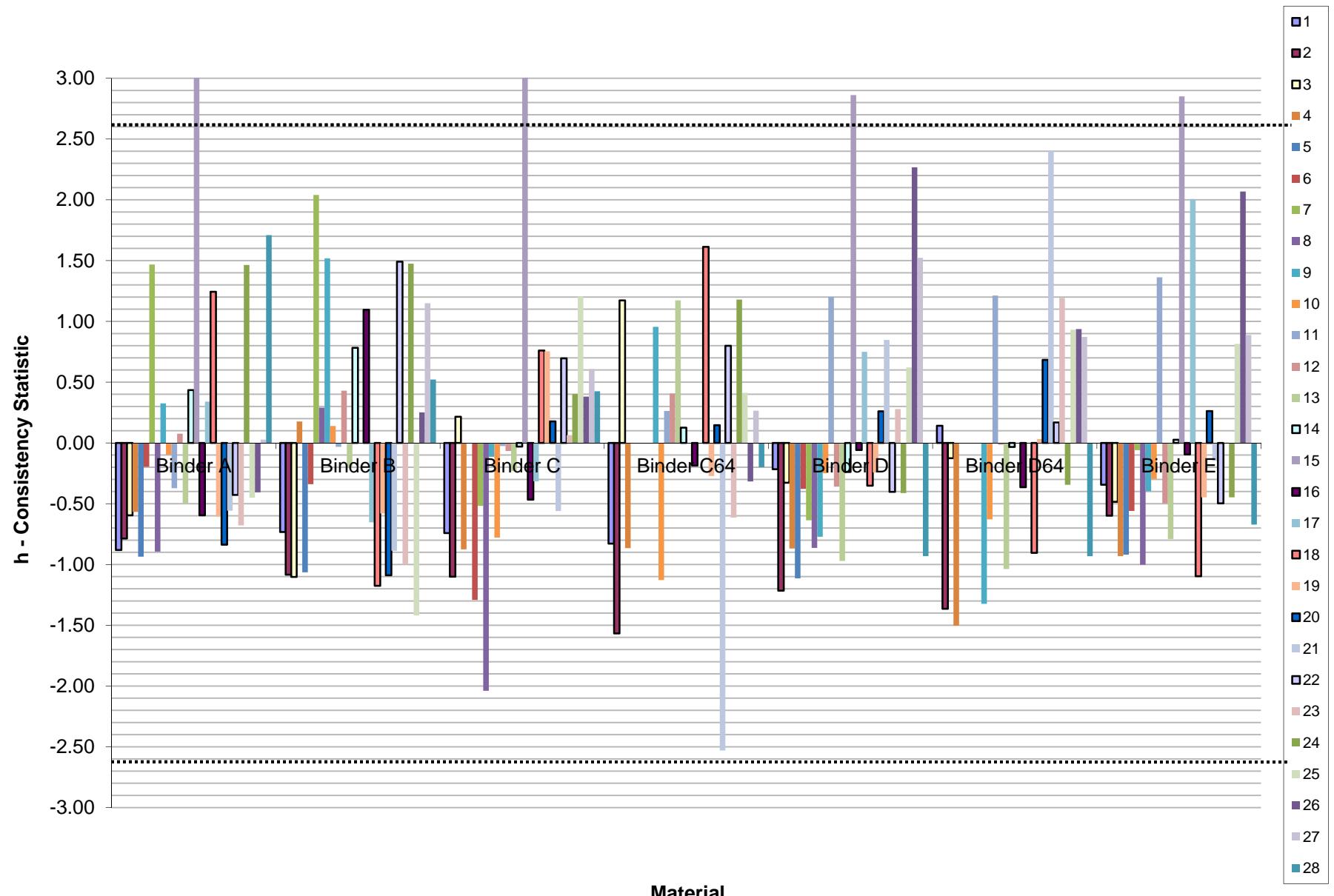
Recovery (0.1 kPa): h - Laboratories within Materials



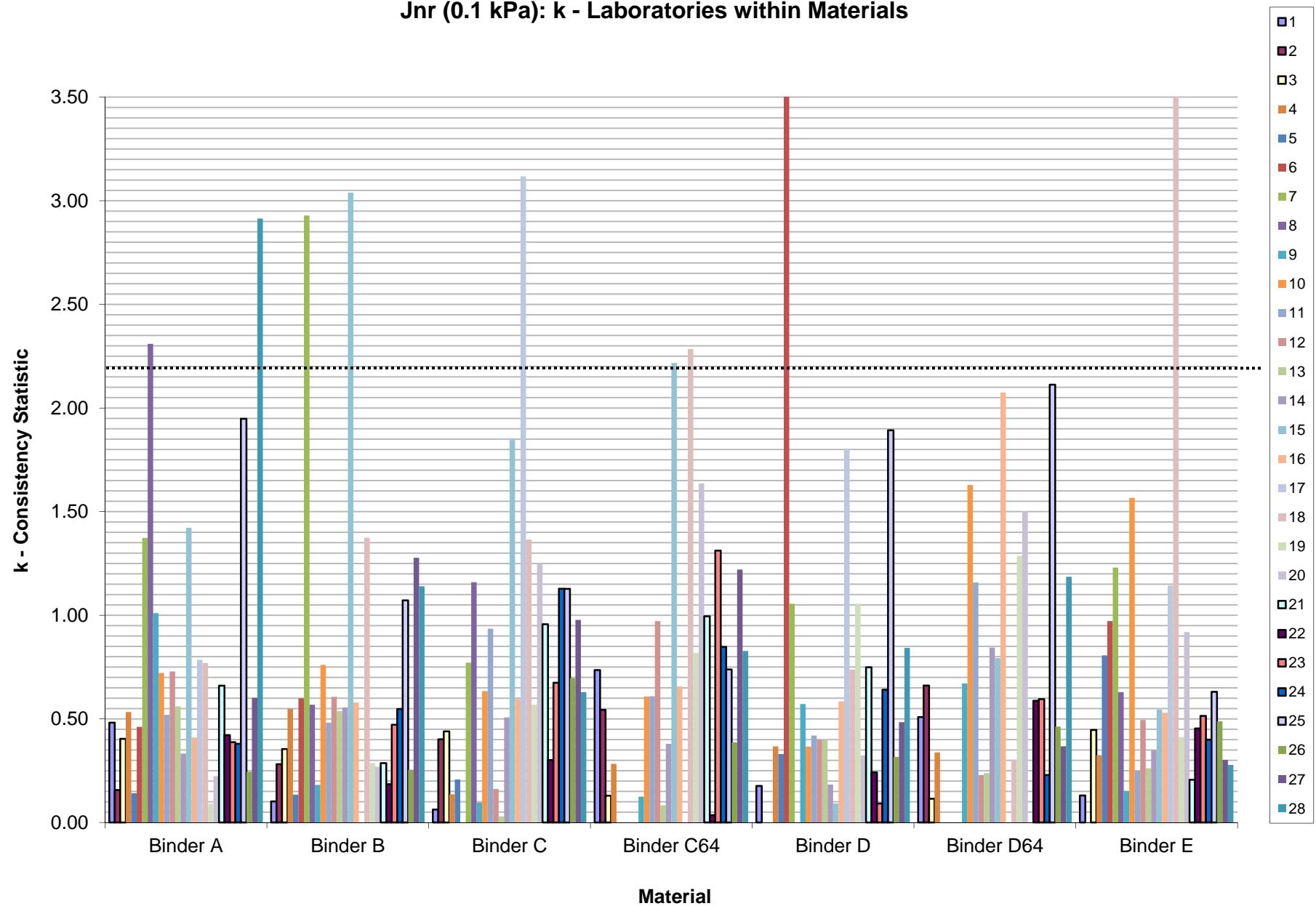
Recovery (3.2 kPa): h - Laboratories within Materials



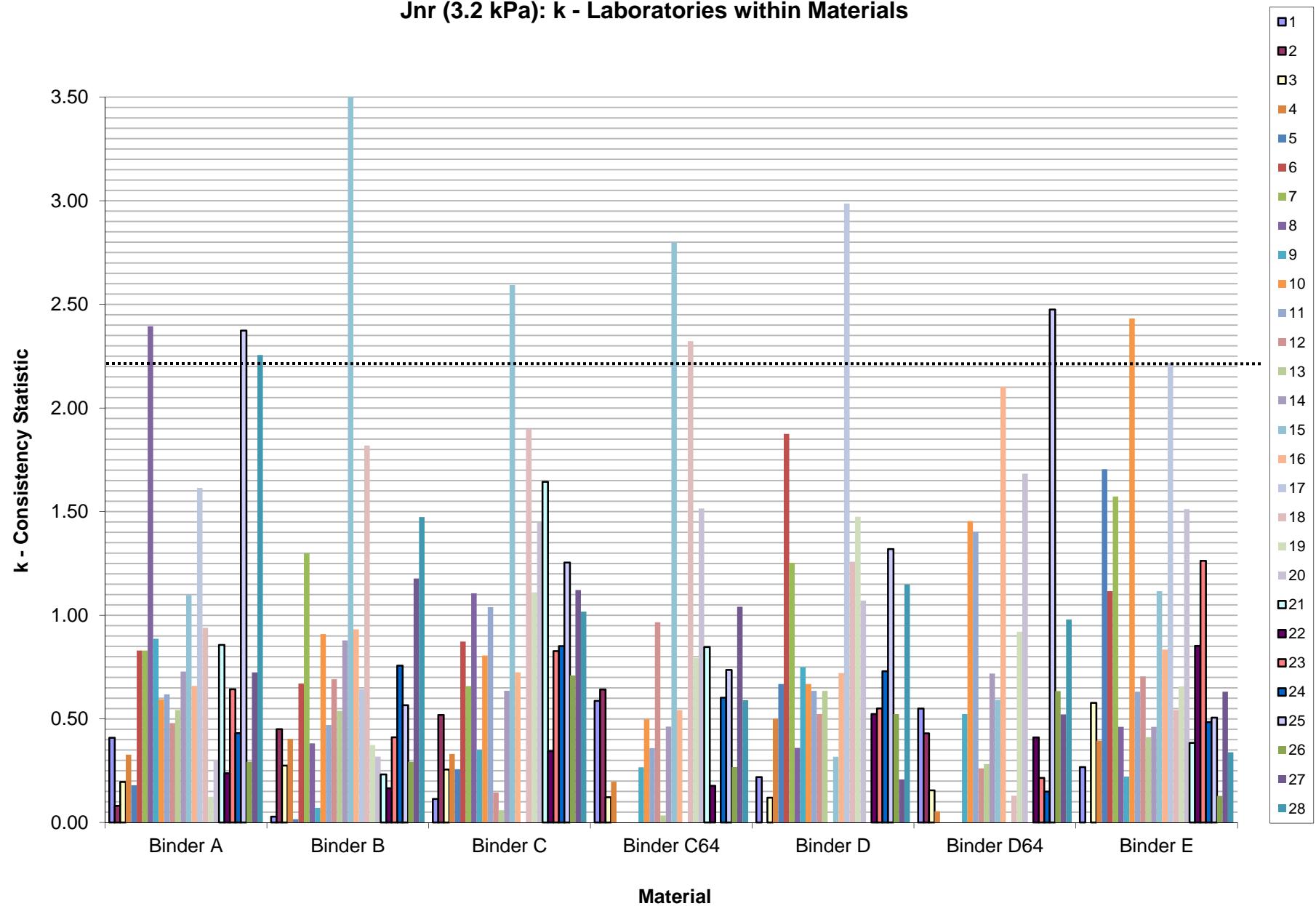
Jnr-Diff: h - Laboratories within Materials



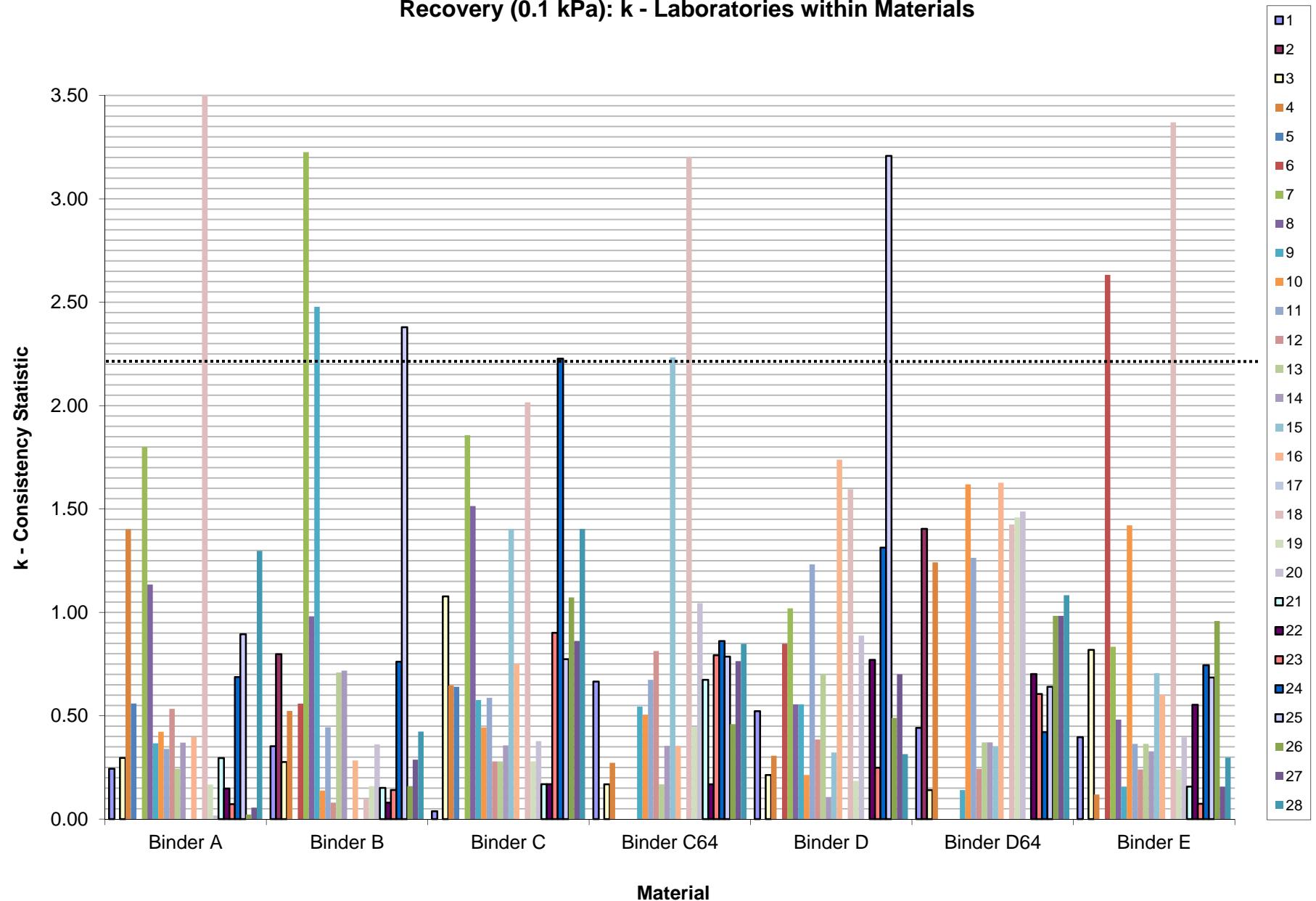
Jnr (0.1 kPa): k - Laboratories within Materials



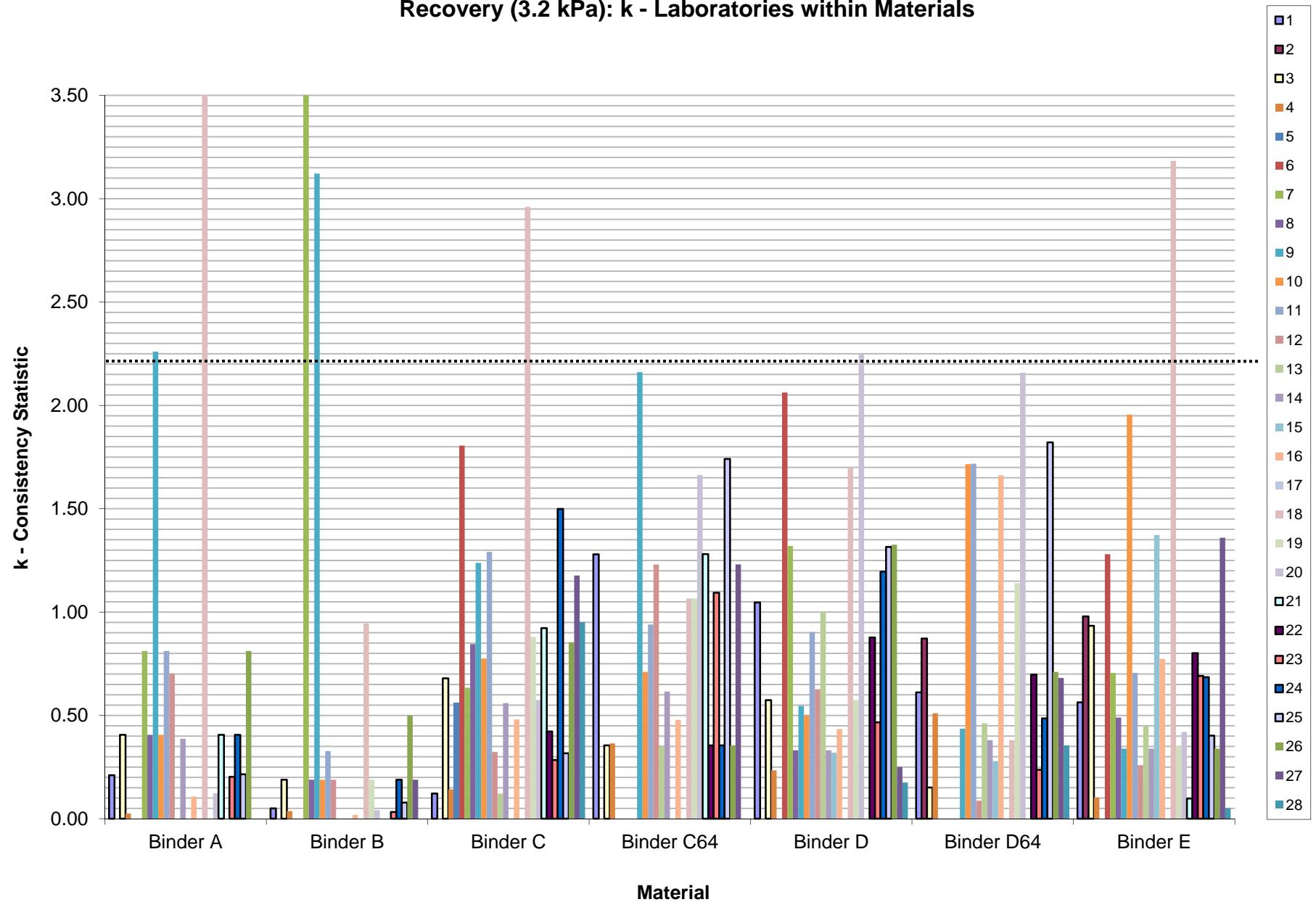
Jnr (3.2 kPa): k - Laboratories within Materials



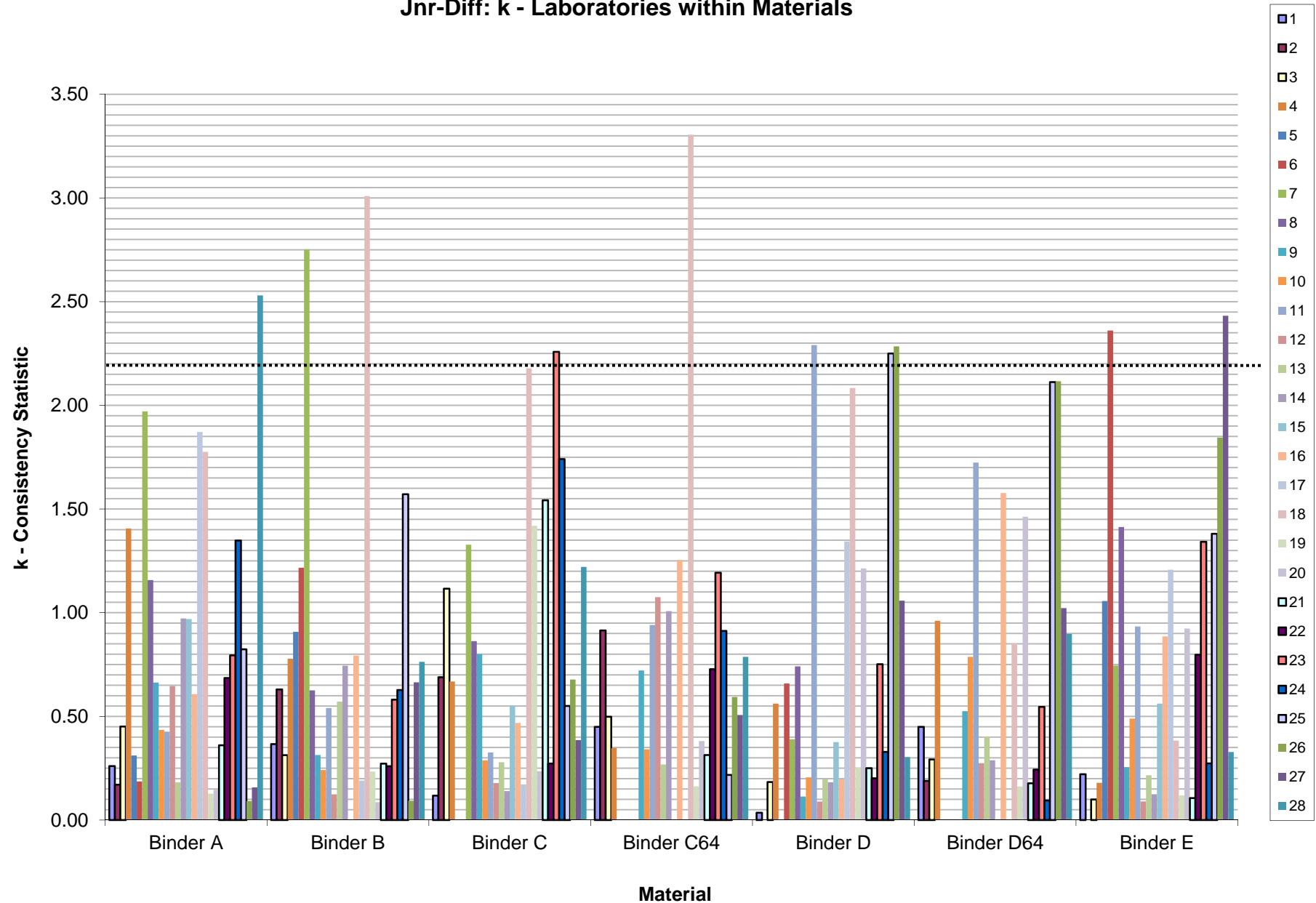
Recovery (0.1 kPa): k - Laboratories within Materials



Recovery (3.2 kPa): k - Laboratories within Materials



Jnr-Diff: k - Laboratories within Materials



APPENDIX

All Data (No Outliers Removed)

Binder A

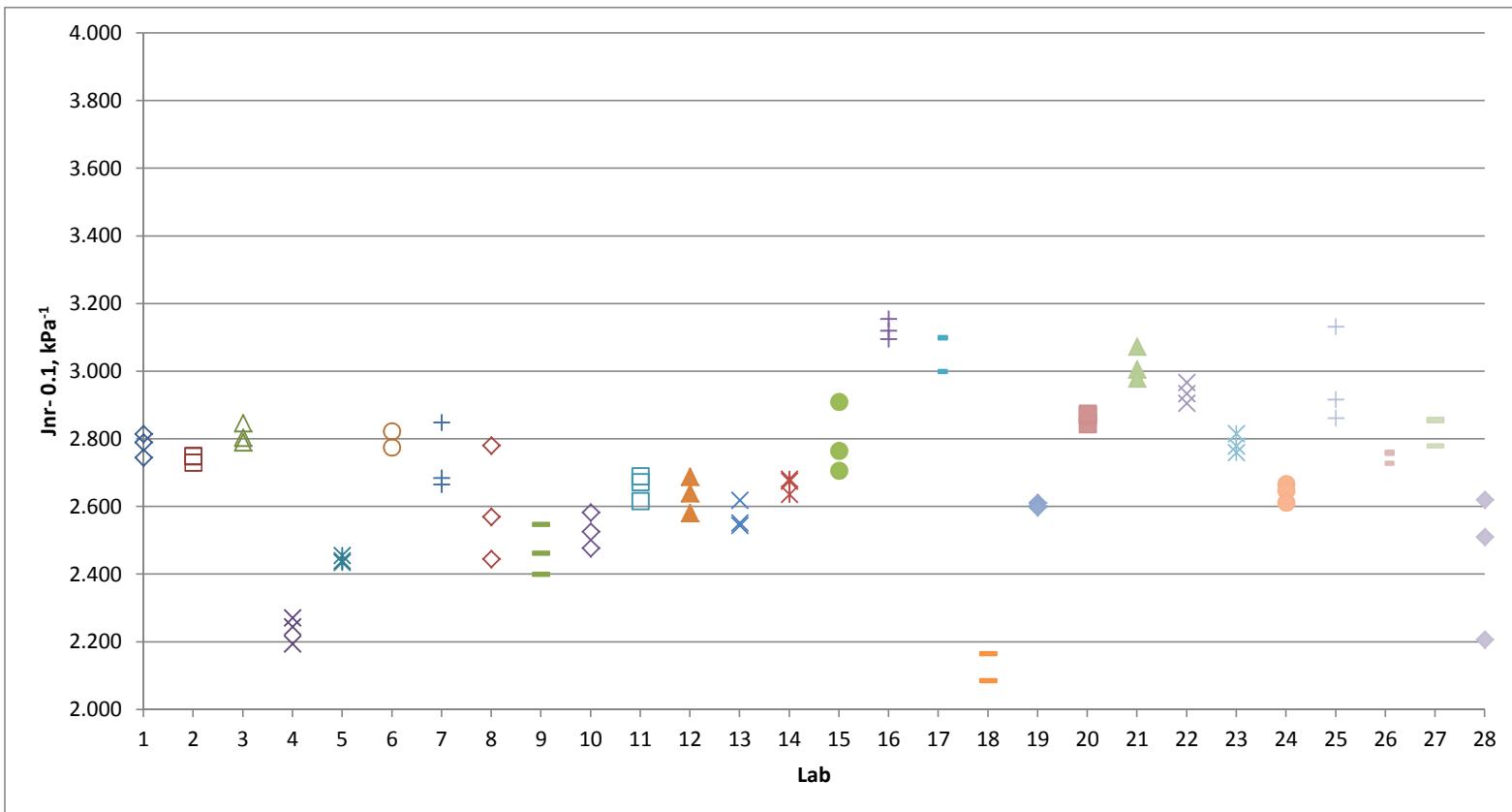
PG 58-28

Jnr (0.1 kPa)

Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		2.815	2.790	2.745	2.78320	0.03544	0.08191	0.35	0.48
2		2.750	2.730	2.750	2.74333	0.01155	0.04204	0.18	0.16
3		2.847	2.804	2.790	2.81367	0.02970	0.11237	0.49	0.40
4		2.194	2.271	2.245	2.23667	0.03917	-0.46463	-2.01	0.53
5		2.435	2.455	2.440	2.44333	0.01041	-0.25796	-1.12	0.14
6		2.775		2.823	2.79900	0.03394	0.09771	0.42	0.46
7		2.665	2.685	2.849	2.73300	0.10096	0.03171	0.14	1.37
8		2.781	2.570	2.445	2.59867	0.16982	-0.10263	-0.44	2.31
9		2.463	2.400	2.548	2.47033	0.07427	-0.23096	-1.00	1.01
10		2.526	2.477	2.583	2.52867	0.05305	-0.17263	-0.75	0.72
11		2.673	2.617	2.690	2.66000	0.03820	-0.04129	-0.18	0.52
12		2.640	2.688	2.581	2.63633	0.05359	-0.06496	-0.28	0.73
13		2.544	2.552	2.619	2.57167	0.04119	-0.12963	-0.56	0.56
14		2.636	2.681	2.675	2.66400	0.02443	-0.03729	-0.16	0.33
15		2.910	2.765	2.707	2.79400	0.10456	0.09271	0.40	1.42
16		3.095	3.120	3.155	3.12333	0.03014	0.42204	1.83	0.41
17		3.100	3.100	3.000	3.06667	0.05774	0.36537	1.58	0.79
18		2.166		2.086	2.12600	0.05657	-0.57529	-2.49	0.77
19		2.602	2.611	2.598	2.60367	0.00666	-0.09763	-0.42	0.09
20		2.844	2.869	2.875	2.86267	0.01644	0.16137	0.70	0.22
21		3.005	3.073	2.979	3.01900	0.04854	0.31771	1.38	0.66
22		2.905	2.934	2.967	2.93533	0.03102	0.23404	1.01	0.42
23		2.760	2.816	2.779	2.78500	0.02848	0.08371	0.36	0.39
24		2.667	2.648	2.612	2.64233	0.02793	-0.05896	-0.26	0.38
25		3.132	2.861	2.916	2.96967	0.14325	0.26837	1.16	1.95
26		2.758	2.729	2.762	2.74967	0.01801	0.04837	0.21	0.24
27		2.854	2.859	2.780	2.83100	0.04424	0.12971	0.56	0.60
28		2.621	2.207	2.511	2.44603	0.21425	-0.25526	-1.10	2.91

Average of Cell Averages
 Standard Deviation of Cell Averages
 Repeatability Standard Deviation
 Reproducibility Standard Deviation

X-bar	2.701
s _{X-bar}	0.231
s _r	0.07352
s _R	0.239
	0.239



Binder A

PG 58-28

Jnr (3.2 kPa)

Lab No.	Lab Name	Results, x					h	k	
		1	2	3	Average	s			
1		3.059	3.046	3.003	3.03597	0.02925	0.06474	0.27	0.21
2		3.000	2.990	3.000	2.99667	0.00577	0.02544	0.11	0.04
3		3.098	3.076	3.072	3.08200	0.01400	0.11077	0.46	0.10
4		2.439	2.436	2.478	2.45100	0.02343	-0.52023	-2.18	0.17
5		2.690	2.694	2.670	2.68467	0.01286	-0.28656	-1.20	0.09
6		3.063	2.987	3.104	3.05133	0.05937	0.08010	0.34	0.43
7		3.015	3.103	3.128	3.08200	0.05935	0.11077	0.46	0.43
8		2.995	2.852	2.654	2.83367	0.17124	-0.13756	-0.58	1.23
9		2.722	2.691	2.813	2.74200	0.06341	-0.22923	-0.96	0.46
10		2.788	2.748	2.833	2.78967	0.04252	-0.18156	-0.76	0.31
11		2.956	2.873	2.941	2.92333	0.04423	-0.04790	-0.20	0.32
12		2.921	2.947	2.879	2.91567	0.03431	-0.05556	-0.23	0.25
13		2.793	2.804	2.865	2.82067	0.03879	-0.15056	-0.63	0.28
14		2.926	3.022	2.939	2.96233	0.05208	-0.00890	-0.04	0.38
15		3.339	3.228	2.190	2.91900	0.63377	-0.05223	-0.22	4.57
16		3.363	3.391	3.455	3.40300	0.04716	0.43177	1.81	0.34
17		3.300	3.500	3.300	3.36667	0.11547	0.39544	1.65	0.83
18		2.470		2.375	2.42250	0.06718	-0.54873	-2.30	0.48
19		2.845	2.862	2.849	2.85200	0.00889	-0.11923	-0.50	0.06
20		3.102	3.127	3.145	3.12467	0.02159	0.15344	0.64	0.16
21		3.277	3.380	3.271	3.30933	0.06127	0.33810	1.41	0.44
22		3.224	3.206	3.240	3.22333	0.01701	0.25210	1.05	0.12
23		2.994	3.071	3.076	3.04700	0.04597	0.07577	0.32	0.33
24		2.992	2.947	3.006	2.98167	0.03083	0.01044	0.04	0.22
25		3.456	3.164	3.160	3.26000	0.16975	0.28877	1.21	1.22
26		3.025	2.997	3.038	3.02000	0.02095	0.04877	0.20	0.15
27		3.151	3.168	3.071	3.13000	0.05180	0.15877	0.66	0.37
28		2.913	2.593	2.786	2.76429	0.16131	-0.20694	-0.87	1.16

Average of Cell Averages

X-bar 2.971

Standard Deviation of Cell Averages

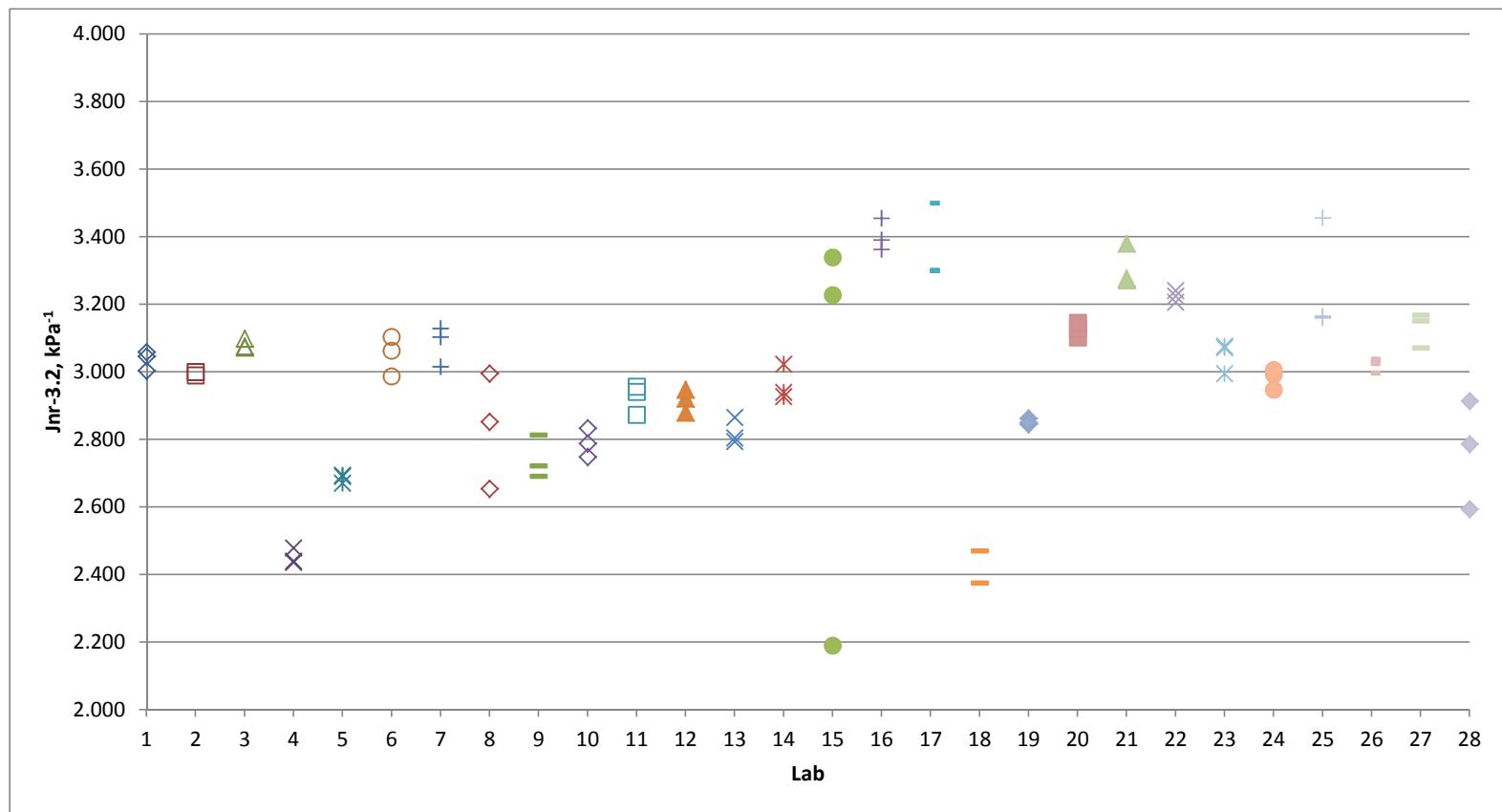
S_{X-bar} 0.239

Repeatability Standard Deviation

S_r 0.13870 0.265

Reproducibility Standard Deviation

S_R 0.265



Binder A

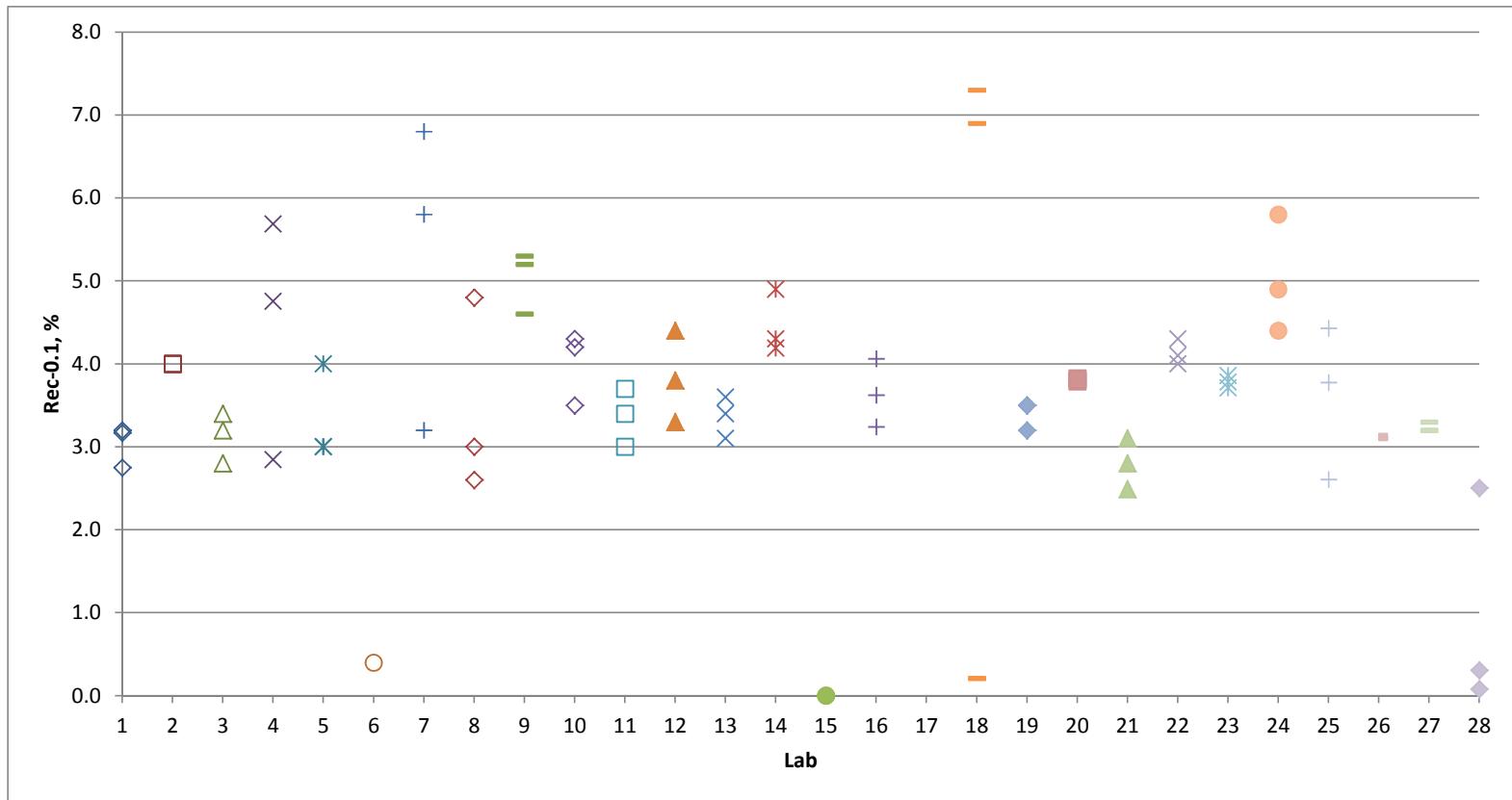
PG 58-28

Recovery (0.1 kPa)

Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		2.8	3.2	3.2	3.040	0.252	-0.421	-0.33	0.24
2		4.0	4.0	4.0	4.000	0.000	0.539	0.42	0.00
3		2.8	3.2	3.4	3.133	0.306	-0.327	-0.26	0.30
4		5.7	2.8	4.8	4.428	1.448	0.968	0.76	1.40
5		4.0	3.0	3.0	3.333	0.577	-0.127	-0.10	0.56
6			0.4	0.400			-3.061	-2.41	0.00
7		5.8	6.8	3.2	5.267	1.858	1.806	1.42	1.80
8		2.6	4.8	3.0	3.467	1.172	0.006	0.00	1.13
9		5.2	5.3	4.6	5.033	0.379	1.573	1.24	0.37
10		4.2	4.3	3.5	4.000	0.436	0.539	0.42	0.42
11		3.7	3.4	3.0	3.367	0.351	-0.094	-0.07	0.34
12		3.8	3.3	4.4	3.833	0.551	0.373	0.29	0.53
13		3.6	3.4	3.1	3.367	0.252	-0.094	-0.07	0.24
14		4.2	4.9	4.3	4.463	0.382	1.003	0.79	0.37
15		0.0	0.0	0.000	0.000	0.000	-3.461	-2.73	0.00
16		3.2	3.6	4.1	3.640	0.410	0.179	0.14	0.40
17									
18		6.9	0.2	7.3	4.803	3.983	1.343	1.06	3.86
19		3.2	3.5	3.5	3.400	0.173	-0.061	-0.05	0.17
20		3.8	3.8	3.8	3.809	0.018	0.348	0.27	0.02
21		2.5	3.1	2.8	2.797	0.305	-0.664	-0.52	0.30
22		4.0	4.1	4.3	4.133	0.153	0.673	0.53	0.15
23		3.9	3.7	3.8	3.783	0.075	0.323	0.25	0.07
24		4.9	4.4	5.8	5.033	0.709	1.573	1.24	0.69
25		3.8	4.4	2.6	3.601	0.923	0.140	0.11	0.89
26		3.1	3.1	3.1	3.113	0.023	-0.347	-0.27	0.02
27		3.2	3.3	3.2	3.233	0.058	-0.227	-0.18	0.06
28		0.3	2.5	0.1	0.964	1.340	-2.497	-1.97	1.30

Average of Cell Averages
 Standard Deviation of Cell Averages
 Repeatability Standard Deviation
 Reproducibility Standard Deviation

X-bar 3.461
 $s_{X\bar{x}}$ 1.270
 s_r 1.03259 1.524
 s_R 1.524



Binder A

PG 58-28

Recovery (3.2 kPa)

Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		0.3	0.4	0.4	0.36000	0.03000	-0.35720	-0.73	0.21
2		1.0	1.0	1.0	1.00000	0.00000	0.28280	0.58	0.00
3		0.3	0.4	0.4	0.36667	0.05774	-0.35053	-0.72	0.41
4		1.4	1.4	1.4	1.44600	0.00361	0.72880	1.50	0.03
5		1.2	1.2	1.2	1.20000	0.00000	0.48280	0.99	0.00
6		0.0	0.0	0.0	0.00000	0.00000	-0.71720	-1.47	0.00
7		0.4	0.4	0.2	0.33333	0.11547	-0.38386	-0.79	0.81
8		1.3	1.2	1.3	1.26667	0.05774	0.54947	1.13	0.41
9		1.6	1.1	1.0	1.23333	0.32146	0.51614	1.06	2.26
10		0.7	0.6	0.6	0.63333	0.05774	-0.08386	-0.17	0.41
11		0.4	0.2	0.4	0.33333	0.11547	-0.38386	-0.79	0.81
12		0.5	0.4	0.6	0.50000	0.10000	-0.21720	-0.45	0.70
13		0.5	0.5	0.5	0.50000	0.00000	-0.21720	-0.45	0.00
14		1.3	1.4	1.3	1.33667	0.05508	0.61947	1.27	0.39
15		0.0	0.0	0.0	0.00000	0.00000	-0.71720	-1.47	0.00
16		1.1	1.1	1.1	1.11667	0.01528	0.39947	0.82	0.11
17									
18		1.0	0.0	1.1	0.70000	0.60828	-0.01720	-0.04	4.28
19		0.5	0.5	0.5	0.50000	0.00000	-0.21720	-0.45	0.00
20		1.3	1.2	1.2	1.23367	0.01756	0.51647	1.06	0.12
21		0.3	0.2	0.3	0.26667	0.05774	-0.45053	-0.93	0.41
22		1.2	1.2	1.2	1.20000	0.00000	0.48280	0.99	0.00
23		1.3	1.2	1.2	1.25667	0.02887	0.53947	1.11	0.20
24		1.2	1.2	1.3	1.23333	0.05774	0.51614	1.06	0.41
25		0.9	1.0	1.0	0.98130	0.03064	0.26410	0.54	0.22
26		0.5	0.3	0.3	0.36667	0.11547	-0.35053	-0.72	0.81
27		0.0	0.0	0.0	0.00000	0.00000	-0.71720	-1.47	0.00
28		0.0	0.0	0.0	0.00000	0.00000	-0.71720	-1.47	0.00

Average of Cell Averages

X-bar 0.717

Standard Deviation of Cell Averages

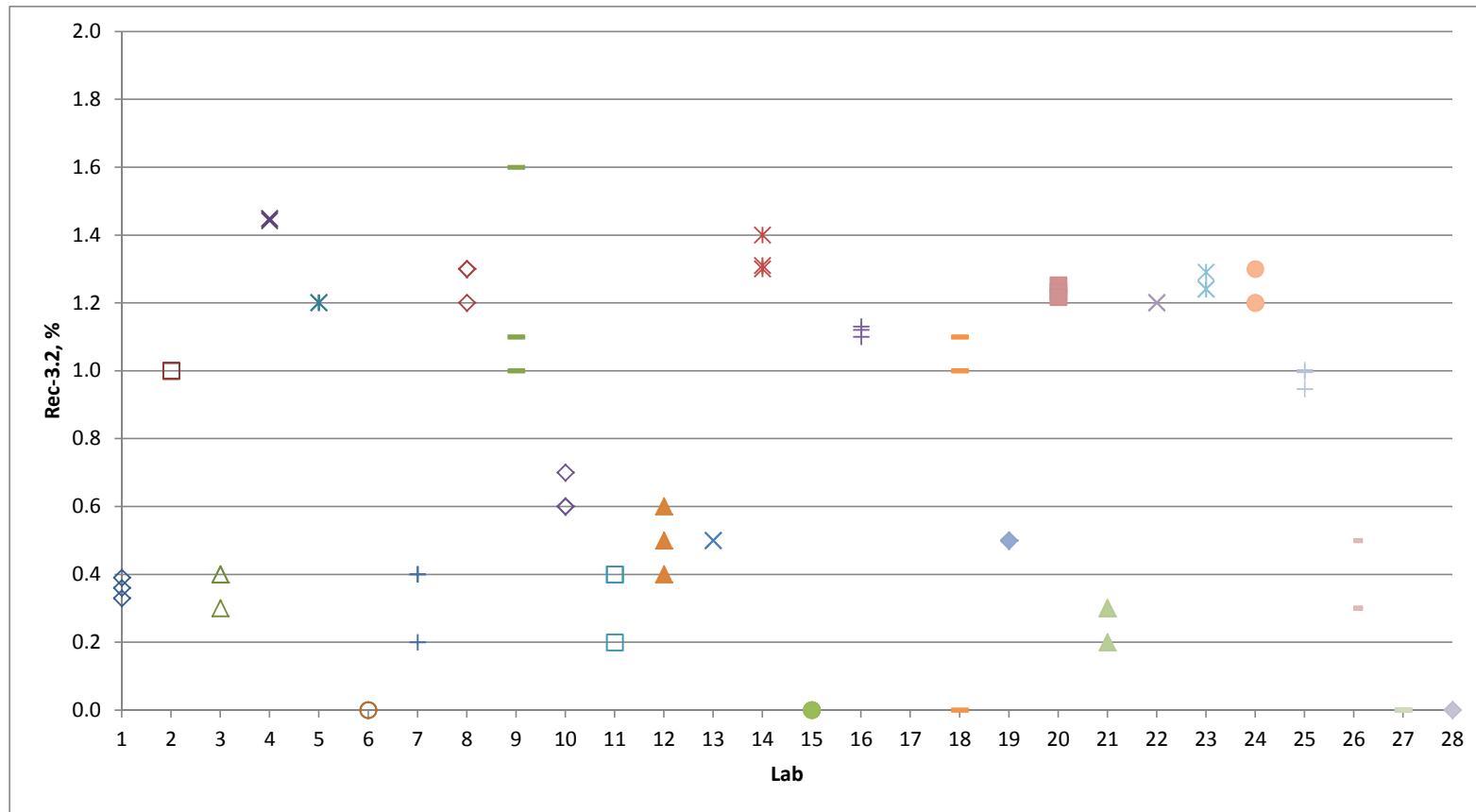
S_{X-bar} 0.487

Repeatability Standard Deviation

S_r 0.14224 0.500

Reproducibility Standard Deviation

S_R 0.500



Binder A

PG 58-28

Jnr-Diff

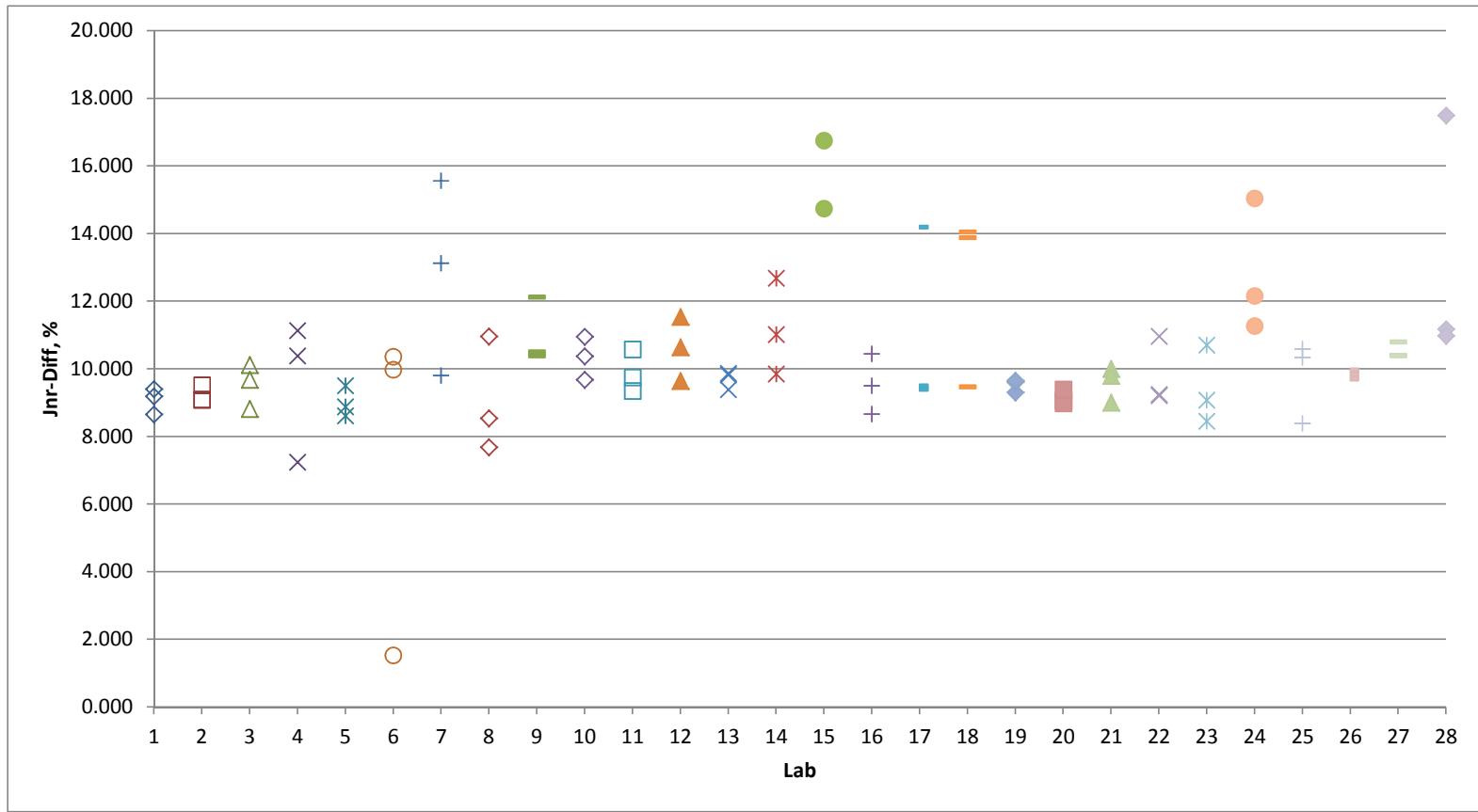
Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		8.660	9.190	9.400	9.08333	0.38136	-1.30391	-0.76	0.22
2		9.091	9.524	9.091	9.23521	0.24994	-1.15203	-0.68	0.14
3		8.819	9.683	10.118	9.54000	0.66120	-0.84724	-0.50	0.38
4		11.130	7.245	10.380	9.58500	2.06090	-0.80224	-0.47	1.18
5		9.500	8.880	8.610	8.99667	0.45633	-1.39058	-0.82	0.26
6		10.370	1.534	9.984	7.29600	4.99377	-3.09124	-1.81	2.87
7		13.129	15.562	9.808	12.83300	2.88840	2.44576	1.43	1.66
8		7.690	10.960	8.542	9.06400	1.69635	-1.32324	-0.78	0.97
9		10.510	12.130	10.390	11.01000	0.97180	0.62276	0.37	0.56
10		10.372	10.954	9.681	10.33567	0.63728	-0.05158	-0.03	0.37
11		10.580	9.753	9.354	9.89567	0.62533	-0.49158	-0.29	0.36
12		10.645	9.648	11.541	10.61133	0.94695	0.22409	0.13	0.54
13		9.819	9.864	9.382	9.68833	0.26624	-0.69891	-0.41	0.15
14		11.017	12.684	9.848	11.18300	1.42527	0.79576	0.47	0.82
15		14.750	16.760		15.75500	1.42128	5.36776	3.15	0.82
16		10.447	8.669	9.501	9.53900	0.88961	-0.84824	-0.50	0.51
17		9.400	14.200	9.500	11.03333	2.74287	0.64609	0.38	1.57
18		14.064	9.471	13.887	12.47400	2.60218	2.08676	1.22	1.49
19		9.310	9.607	9.655	9.52400	0.18688	-0.86324	-0.51	0.11
20		9.076	8.989	9.395	9.15333	0.21376	-1.23391	-0.72	0.12
21		9.000	10.000	9.800	9.60000	0.52915	-0.78724	-0.46	0.30
22		10.966	9.248	9.208	9.80733	1.00363	-0.57991	-0.34	0.58
23		8.448	9.071	10.702	9.40700	1.16396	-0.98024	-0.57	0.67
24		12.160	11.270	15.050	12.82667	1.97622	2.43942	1.43	1.13
25		10.340	10.590	8.385	9.77167	1.20738	-0.61558	-0.36	0.69
26		9.703	9.850	9.973	9.84200	0.13518	-0.54524	-0.32	0.08
27		10.400	10.800	10.400	10.53333	0.23094	0.14609	0.09	0.13
28		11.179	17.500	10.978	13.21890	3.70849	2.83166	1.66	2.13

Average of Cell Averages X-bar 10.387

Standard Deviation of Cell Averages S_{X-bar} 1.706

Repeatability Standard Deviation S_r 1.74249 2.221

Reproducibility Standard Deviation S_R 2.221



Binder B

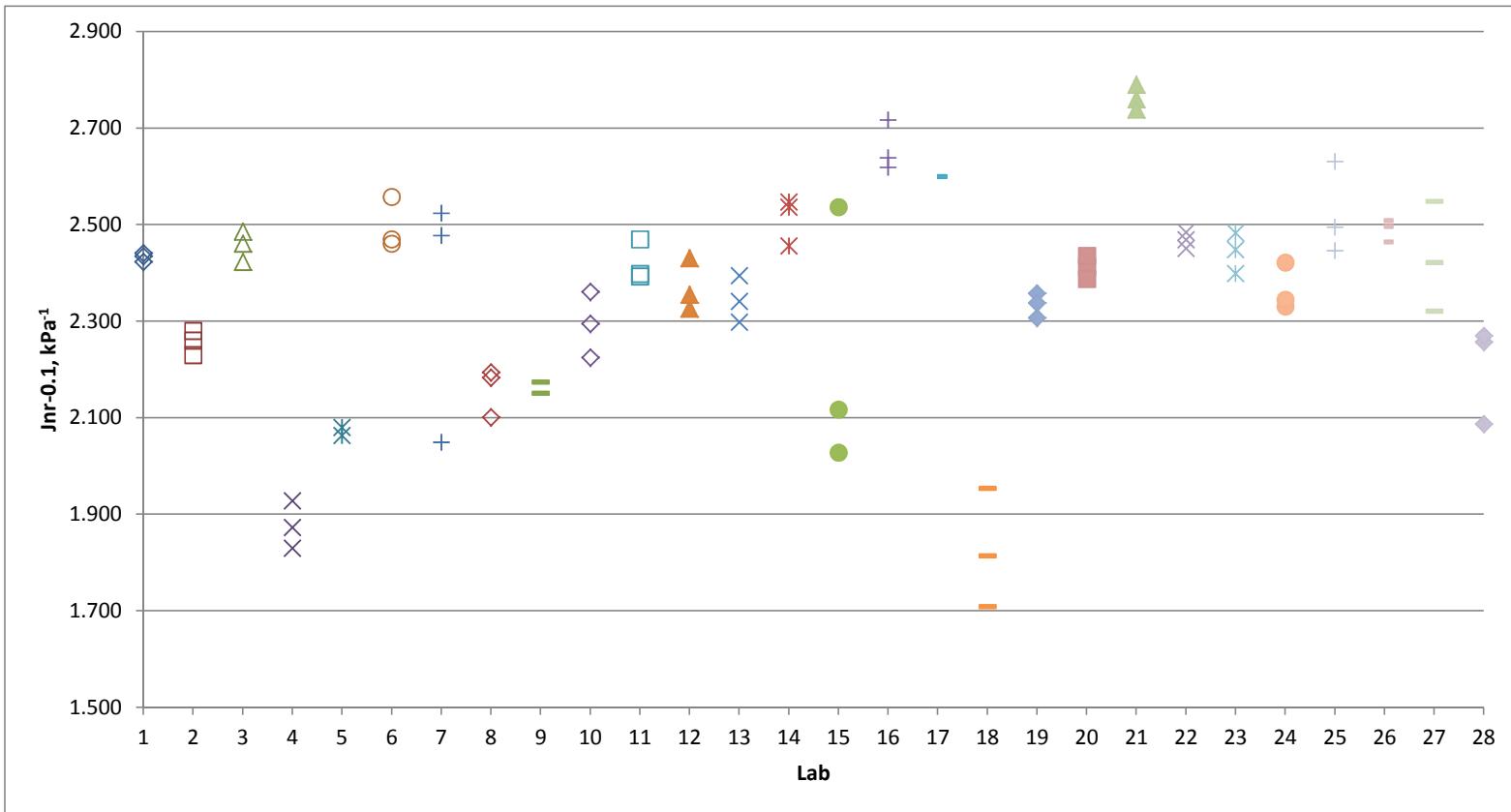
PG 64-22

Jnr (0.1 kPa)

Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		2.434	2.441	2.423	2.43280	0.00911	0.07733	0.37	0.10
2		2.280	2.260	2.230	2.25667	0.02517	-0.09880	-0.47	0.28
3		2.423	2.461	2.486	2.45667	0.03172	0.10120	0.48	0.35
4		1.830	1.873	1.928	1.87700	0.04912	-0.47847	-2.29	0.55
5		2.080	2.063	2.07150	0.01202	-0.28397	-1.36	0.13	
6		2.470	2.461	2.558	2.49633	0.05359	0.14086	0.67	0.60
7		2.049	2.478	2.524	2.35033	0.26197	-0.00514	-0.02	2.93
8		2.194	2.183	2.101	2.15933	0.05082	-0.19614	-0.94	0.57
9		2.174	2.151		2.16250	0.01626	-0.19297	-0.92	0.18
10		2.225	2.295	2.361	2.29367	0.06801	-0.06180	-0.30	0.76
11		2.393	2.398	2.470	2.42033	0.04309	0.06486	0.31	0.48
12		2.431	2.326	2.355	2.37067	0.05422	0.01520	0.07	0.61
13		2.298	2.341	2.394	2.34433	0.04809	-0.01114	-0.05	0.54
14		2.547	2.456	2.536	2.51300	0.04967	0.15753	0.75	0.56
15		2.537	2.028	2.117	2.22733	0.27185	-0.12814	-0.61	3.04
16		2.619	2.717	2.639	2.65833	0.05178	0.30286	1.45	0.58
17		2.600	2.600	2.600	2.60000	0.00000	0.24453	1.17	0.00
18		1.709	1.954	1.814	1.82567	0.12292	-0.52980	-2.54	1.37
19		2.358	2.307	2.338	2.33433	0.02570	-0.02114	-0.10	0.29
20		2.413	2.436	2.388	2.41233	0.02401	0.05686	0.27	0.27
21		2.760	2.739	2.790	2.76300	0.02563	0.40753	1.95	0.29
22		2.484	2.451	2.469	2.46800	0.01652	0.11253	0.54	0.18
23		2.483	2.448	2.399	2.44333	0.04219	0.08786	0.42	0.47
24		2.422	2.331	2.345	2.36600	0.04900	0.01053	0.05	0.55
25		2.446	2.631	2.495	2.52400	0.09585	0.16853	0.81	1.07
26		2.465	2.509	2.497	2.49033	0.02274	0.13486	0.65	0.25
27		2.422	2.321	2.549	2.43067	0.11425	0.07520	0.36	1.28
28		2.257	2.270	2.087	2.20470	0.10196	-0.15077	-0.72	1.14

Average of Cell Averages
 Standard Deviation of Cell Averages
 Repeatability Standard Deviation
 Reproducibility Standard Deviation

X-bar	2.355
s _{X-bar}	0.209
s _r	0.08945
s _R	0.221



Binder B

PG 64-22

Jnr (3.2 kPa)

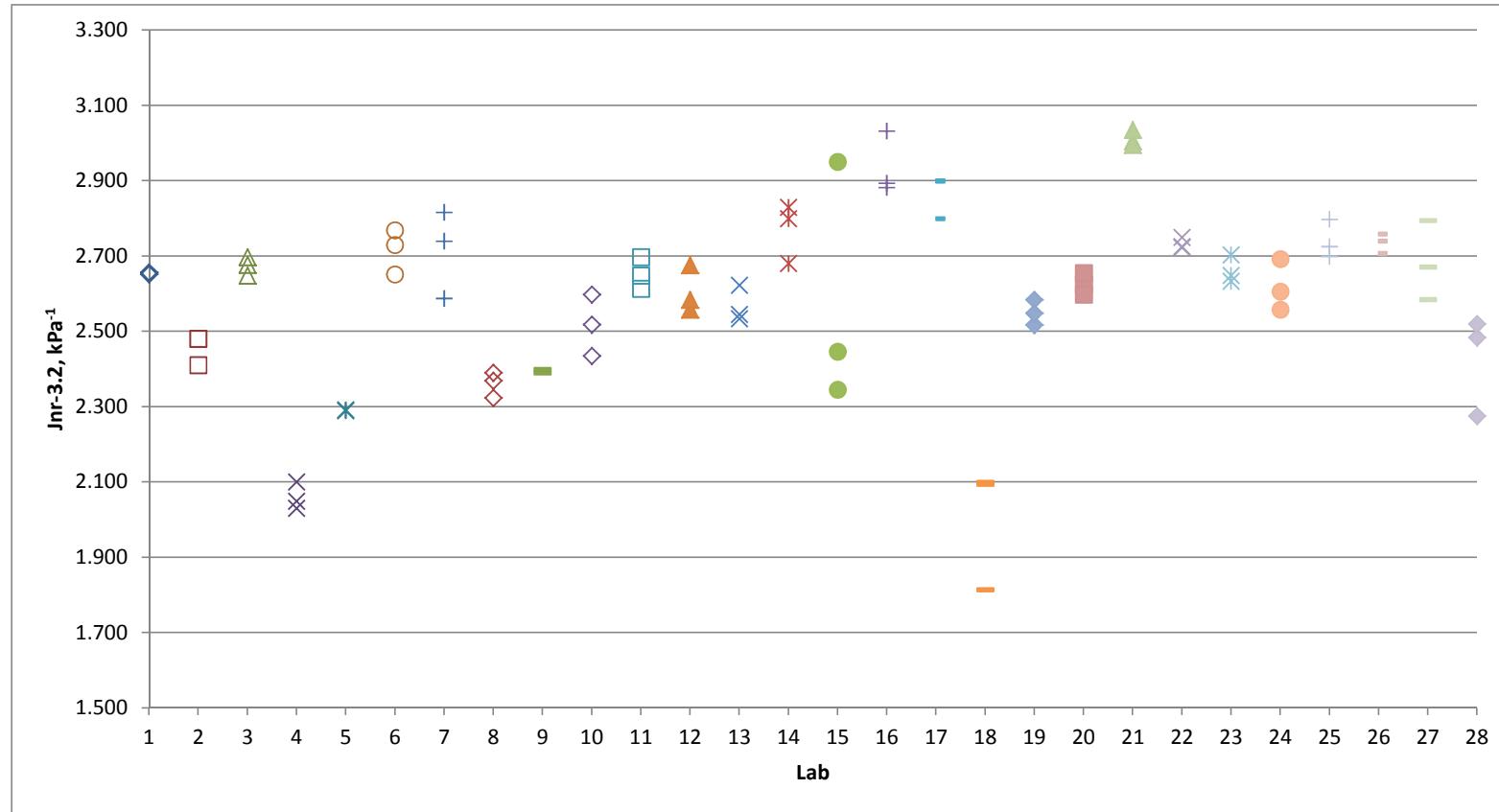
Lab No.	Lab Name	Results, x					h	k	
		1	2	3	Average	s			
1		2.656	2.652	2.656	2.65440	0.00252	0.06148	0.27	0.03
2		2.480	2.480	2.410	2.45667	0.04041	-0.13625	-0.60	0.45
3		2.648	2.677	2.697	2.67400	0.02464	0.08108	0.36	0.27
4		2.030	2.049	2.100	2.05967	0.03620	-0.53325	-2.35	0.40
5		2.289	2.291	2.29000	0.00141	-0.30292	-1.33	0.02	
6		2.730	2.651	2.769	2.71667	0.06012	0.12375	0.54	0.67
7		2.587	2.816	2.739	2.71400	0.11653	0.12108	0.53	1.30
8		2.390	2.369	2.323	2.36067	0.03427	-0.23225	-1.02	0.38
9		2.399	2.390		2.39450	0.00636	-0.19842	-0.87	0.07
10		2.435	2.518	2.598	2.51700	0.08150	-0.07592	-0.33	0.91
11		2.613	2.648	2.697	2.65267	0.04219	0.05975	0.26	0.47
12		2.676	2.558	2.584	2.60600	0.06200	0.01308	0.06	0.69
13		2.533	2.545	2.622	2.56667	0.04829	-0.02625	-0.12	0.54
14		2.829	2.680	2.799	2.76933	0.07881	0.17641	0.78	0.88
15		2.950	2.345	2.446	2.58033	0.32410	-0.01259	-0.06	3.61
16		2.882	3.032	2.893	2.93567	0.08361	0.34275	1.51	0.93
17		2.800	2.900	2.900	2.86667	0.05774	0.27375	1.21	0.64
18		1.814	2.099	2.094	2.00233	0.16312	-0.59059	-2.60	1.82
19		2.584	2.517	2.548	2.54967	0.03353	-0.04325	-0.19	0.37
20		2.625	2.655	2.598	2.62600	0.02851	0.03308	0.15	0.32
21		3.005	2.995	3.035	3.01167	0.02082	0.41875	1.84	0.23
22		2.749	2.722	2.725	2.73200	0.01480	0.13908	0.61	0.17
23		2.703	2.648	2.633	2.66133	0.03686	0.06841	0.30	0.41
24		2.692	2.558	2.606	2.61867	0.06789	0.02575	0.11	0.76
25		2.699	2.797	2.725	2.74033	0.05077	0.14741	0.65	0.57
26		2.707	2.759	2.740	2.73533	0.02631	0.14241	0.63	0.29
27		2.671	2.585	2.795	2.68367	0.10557	0.09075	0.40	1.18
28		2.483	2.520	2.275	2.42589	0.13215	-0.16703	-0.74	1.47

Average of Cell Averages X-bar 2.593

Standard Deviation of Cell Averages S_{X-bar} 0.227

Repeatability Standard Deviation S_r 0.08968 0.239

Reproducibility Standard Deviation S_R 0.239



Binder B

PG 64-22

Recovery (0.1 kPa)

Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		3.7	3.5	4.0	3.713	0.255	-0.029	-0.02	0.20
2		5.0	4.0	5.0	4.667	0.577	0.924	0.60	0.44
3		3.6	3.4	3.2	3.400	0.200	-0.343	-0.22	0.15
4		5.7	5.0	5.1	5.279	0.379	1.537	1.00	0.29
5			4.0	4.0	4.000	0.000	0.257	0.17	0.00
6		0.0	0.7	0.0	0.233	0.404	-3.509	-2.28	0.31
7		12.6	6.3	3.0	7.300	4.877	3.557	2.32	3.76
8		4.2	5.1	5.6	4.967	0.709	1.224	0.80	0.55
9		5.5	5.3	2.3	4.367	1.793	0.624	0.41	1.38
10		3.9	4.0	4.1	4.000	0.100	0.257	0.17	0.08
11		3.4	3.9	3.3	3.533	0.321	-0.209	-0.14	0.25
12		3.9	4.0	4.0	3.967	0.058	0.224	0.15	0.04
13		4.0	3.0	3.7	3.567	0.513	-0.176	-0.11	0.40
14		5.1	4.2	4.2	4.500	0.520	0.757	0.49	0.40
15		0.0	0.0	0.0	0.000	0.000	-3.743	-2.44	0.00
16		4.0	4.4	4.2	4.203	0.205	0.461	0.30	0.16
17									
18		2.7	2.8	9.0	4.833	3.609	1.091	0.71	2.78
19		3.8	3.6	3.6	3.667	0.115	-0.076	-0.05	0.09
20		4.2	4.4	3.9	4.163	0.262	0.421	0.27	0.20
21		3.0	3.1	2.9	3.013	0.110	-0.730	-0.48	0.08
22		4.6	4.6	4.5	4.567	0.058	0.824	0.54	0.04
23		4.1	4.3	4.1	4.133	0.102	0.391	0.25	0.08
24		4.8	3.9	4.9	4.533	0.551	0.791	0.51	0.42
25		4.8	1.5	3.8	3.362	1.721	-0.380	-0.25	1.33
26		3.5	3.5	3.3	3.433	0.115	-0.309	-0.20	0.09
27		3.6	3.5	3.2	3.433	0.208	-0.309	-0.20	0.16
28		0.1	0.6	0.0	0.221	0.306	-3.522	-2.29	0.24

Average of Cell Averages

X-bar 3.743

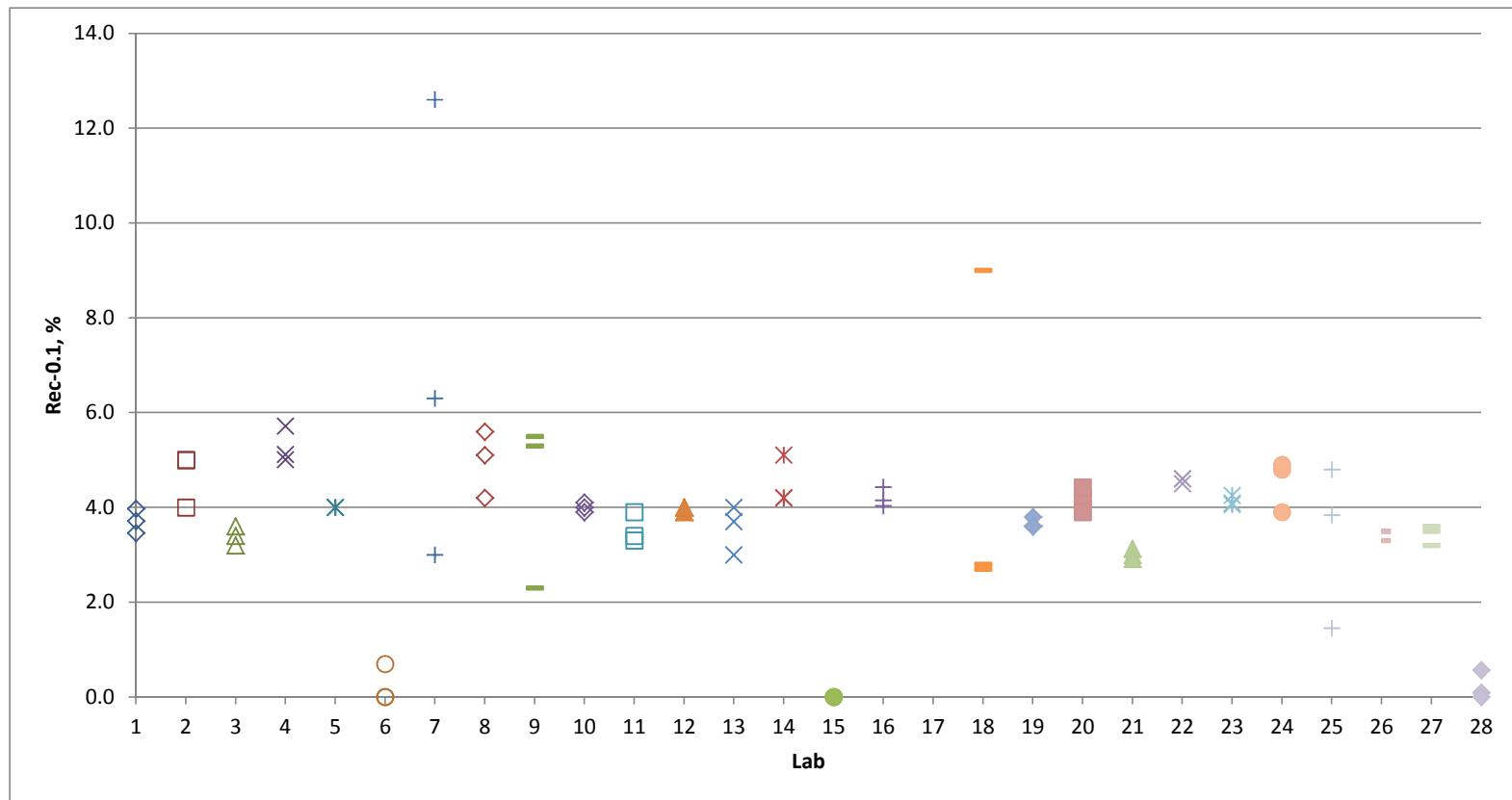
Standard Deviation of Cell Averages

$S_{X\text{-har}}$ 1.536

Repeatability Standard Deviation

s_r 1.29802 1.866

Reproducibility Standard Deviation



Binder B

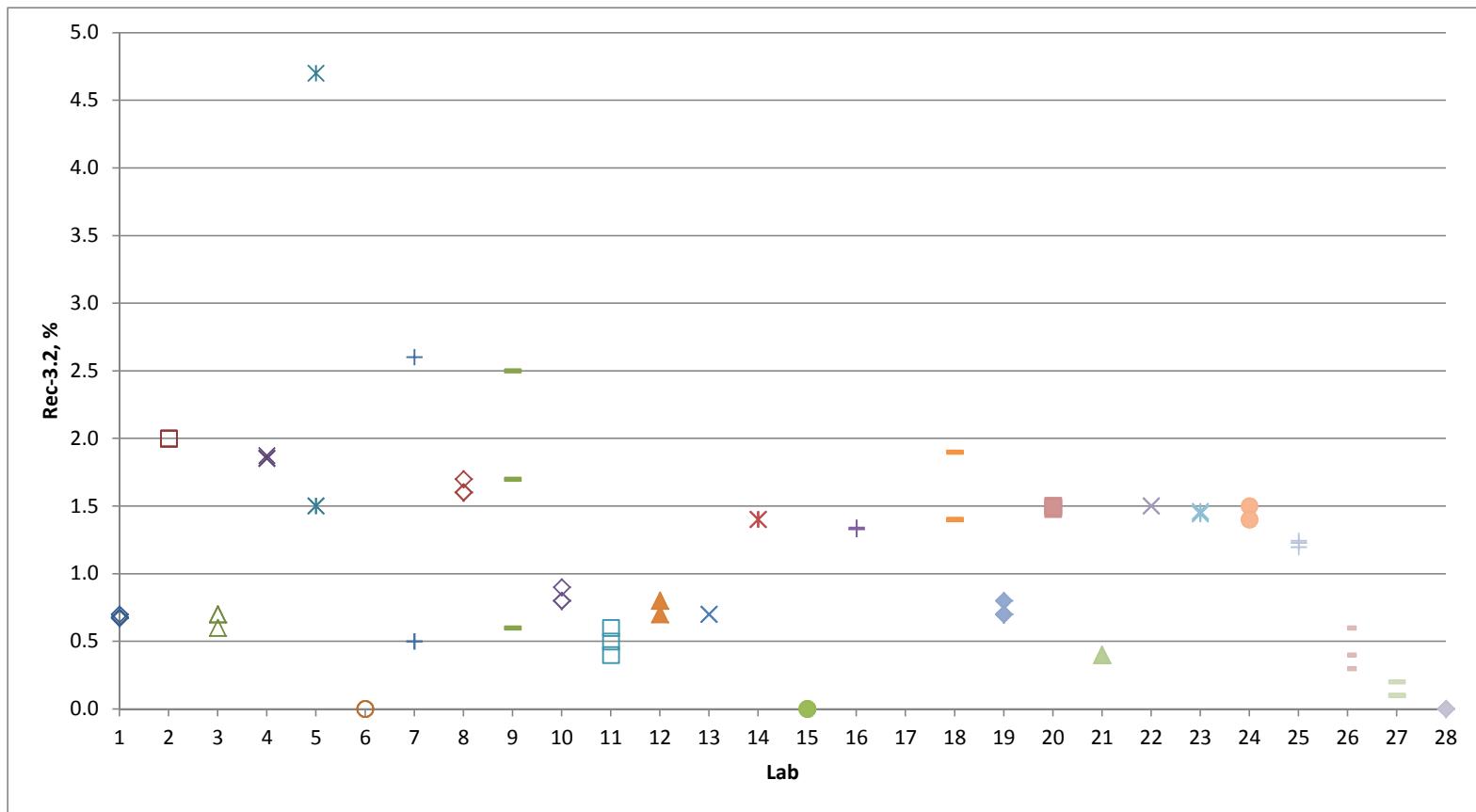
PG 64-22

Recovery (3.2 kPa)

Lab No.	Lab Name	Results, x					h	k
		1	2	3	Average	s		
1		0.7	0.7	0.7	0.68333	0.01528	-0.35763	-0.54
2		2.0	2.0	2.0	2.00000	0.00000	0.95904	1.44
3		0.7	0.7	0.6	0.66667	0.05774	-0.37430	-0.56
4		1.9	1.9	1.9	1.85900	0.01136	0.81804	1.22
5		4.7	1.5	1.5	2.56667	1.84752	1.52570	2.28
6		0.0	0.0	0.0	0.00000	0.00000	-1.04096	-1.56
7		2.6	0.5	0.5	1.20000	1.21244	0.15904	0.24
8		1.6	1.6	1.7	1.63333	0.05774	0.59237	0.89
9		1.7	0.6	2.5	1.60000	0.95394	0.55904	0.84
10		0.8	0.9	0.8	0.83333	0.05774	-0.20763	-0.31
11		0.5	0.4	0.6	0.50000	0.10000	-0.54096	-0.81
12		0.7	0.8	0.8	0.76667	0.05774	-0.27430	-0.41
13		0.7	0.7	0.7	0.70000	0.00000	-0.34096	-0.51
14		1.4	1.4	1.4	1.40000	0.00000	0.35904	0.54
15		0.0	0.0	0.0	0.00000	0.00000	-1.04096	-1.56
16		1.3	1.3	1.3	1.33333	0.00577	0.29237	0.44
17								
18		1.9	1.4	1.4	1.56667	0.28868	0.52570	0.79
19		0.7	0.8	0.7	0.73333	0.05774	-0.30763	-0.46
20		1.5	1.5	1.5	1.49267	0.01266	0.45170	0.68
21		0.4	0.4	0.4	0.40000	0.00000	-0.64096	-0.96
22		1.5	1.5	1.5	1.50000	0.00000	0.45904	0.69
23		1.5	1.4	1.5	1.45000	0.01000	0.40904	0.61
24		1.4	1.5	1.4	1.43333	0.05774	0.39237	0.59
25		1.2	1.2	1.2	1.22100	0.02390	0.18004	0.27
26		0.6	0.4	0.3	0.43333	0.15275	-0.60763	-0.91
27		0.2	0.1	0.1	0.13333	0.05774	-0.90763	-1.36
28		0.0	0.0	0.0	0.00000	0.00000	-1.04096	-1.56

Average of Cell Averages
 Standard Deviation of Cell Averages
 Repeatability Standard Deviation
 Reproducibility Standard Deviation

X-bar	1.041
S _{X-bar}	0.668
S _r	0.46883
S _R	0.770



Binder B

PG 64-22

Jnr-Diff

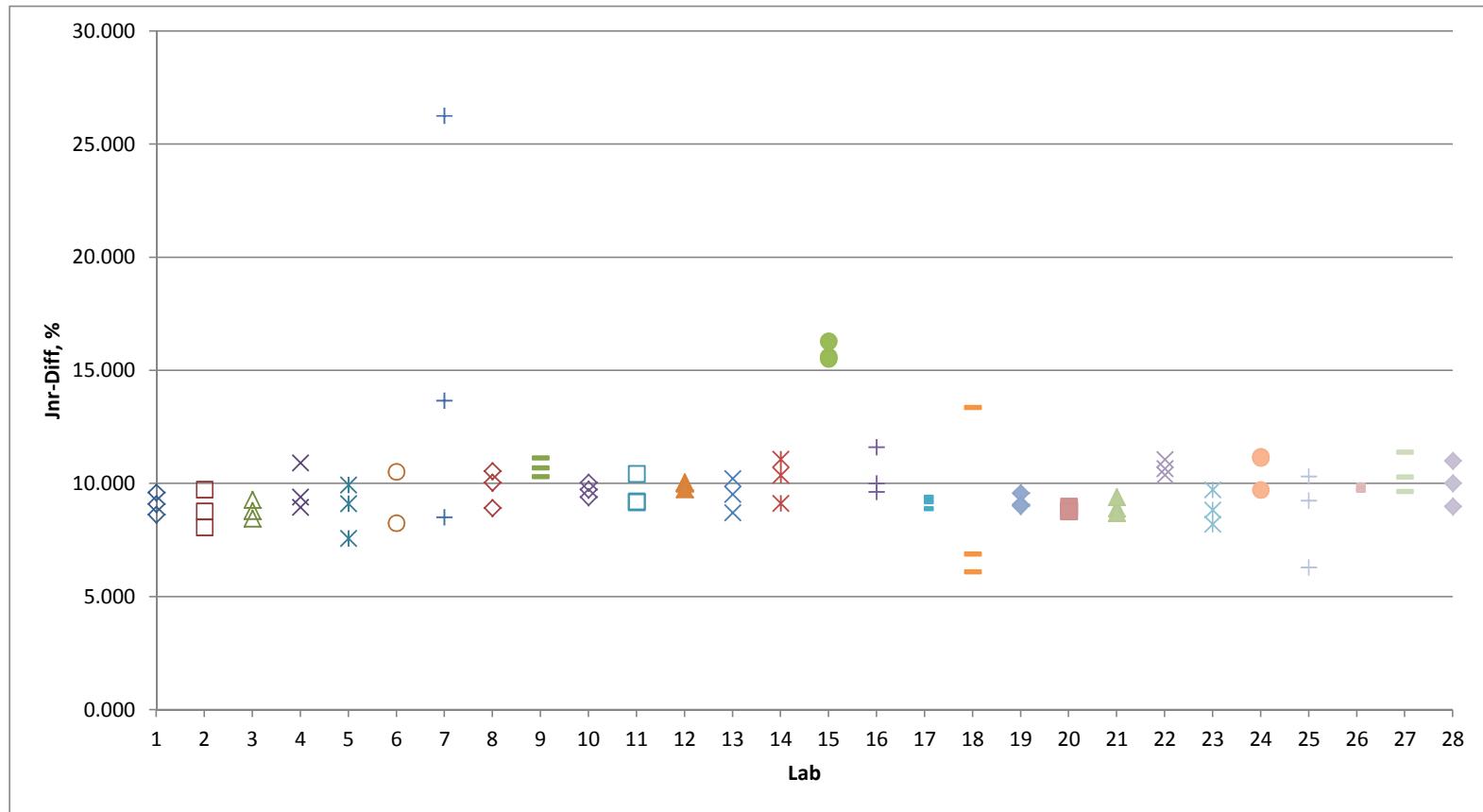
Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		9.100	8.630	9.600	9.11000	0.48508	-0.92418	-0.51	0.24
2		8.772	9.735	8.072	8.85940	0.83483	-1.17478	-0.65	0.41
3		9.284	8.795	8.460	8.84633	0.41439	-1.18785	-0.66	0.20
4		10.920	9.404	8.952	9.75867	1.03082	-0.27551	-0.15	0.50
5		7.570	9.110	9.940	8.87333	1.20259	-1.16085	-0.65	0.59
6		10.530		8.251	9.39050	1.61150	-0.64368	-0.36	0.79
7		26.259	13.665	8.512	16.14533	9.12979	6.11115	3.40	4.45
8		8.930	10.040	10.550	9.84000	0.82831	-0.19418	-0.11	0.40
9		10.310	11.140	10.700	10.71667	0.41525	0.68249	0.38	0.20
10		9.407	9.744	10.045	9.73200	0.31917	-0.30218	-0.17	0.16
11		9.173	10.436	9.221	9.61000	0.71574	-0.42418	-0.24	0.35
12		10.062	10.004	9.753	9.93967	0.16424	-0.09451	-0.05	0.08
13		10.226	8.715	9.529	9.49000	0.75625	-0.54418	-0.30	0.37
14		11.076	9.128	10.370	10.19133	0.98621	0.15715	0.09	0.48
15		16.290	15.620	15.520	15.81000	0.41869	5.77582	3.21	0.20
16		10.003	11.609	9.633	10.41500	1.05045	0.38082	0.21	0.51
17		9.200	9.400	8.900	9.16667	0.25166	-0.86751	-0.48	0.12
18		6.111	6.897	13.374	8.79400	3.98582	-1.24018	-0.69	1.94
19		9.575	9.068	9.013	9.21867	0.30982	-0.81551	-0.45	0.15
20		8.798	8.988	8.782	8.85600	0.11459	-1.17818	-0.66	0.06
21		8.900	9.400	8.700	9.00000	0.36056	-1.03418	-0.58	0.18
22		10.658	11.059	10.375	10.69733	0.34369	0.66315	0.37	0.17
23		8.828	8.200	9.730	8.91933	0.76908	-1.11485	-0.62	0.38
24		11.190	9.727	11.140	10.68567	0.83061	0.65149	0.36	0.41
25		10.320	6.299	9.242	8.62033	2.08134	-1.41385	-0.79	1.02
26		9.781	9.949	9.708	9.81267	0.12358	-0.22151	-0.12	0.06
27		10.300	11.400	9.660	10.45333	0.88008	0.41915	0.23	0.43
28		10.022	11.007	8.985	10.00477	1.01078	-0.02941	-0.02	0.49

Average of Cell Averages X-bar 10.034

Standard Deviation of Cell Averages S_{X-bar} 1.797

Repeatability Standard Deviation S_r 2.04955 2.455

Reproducibility Standard Deviation S_R 2.455



Binder C

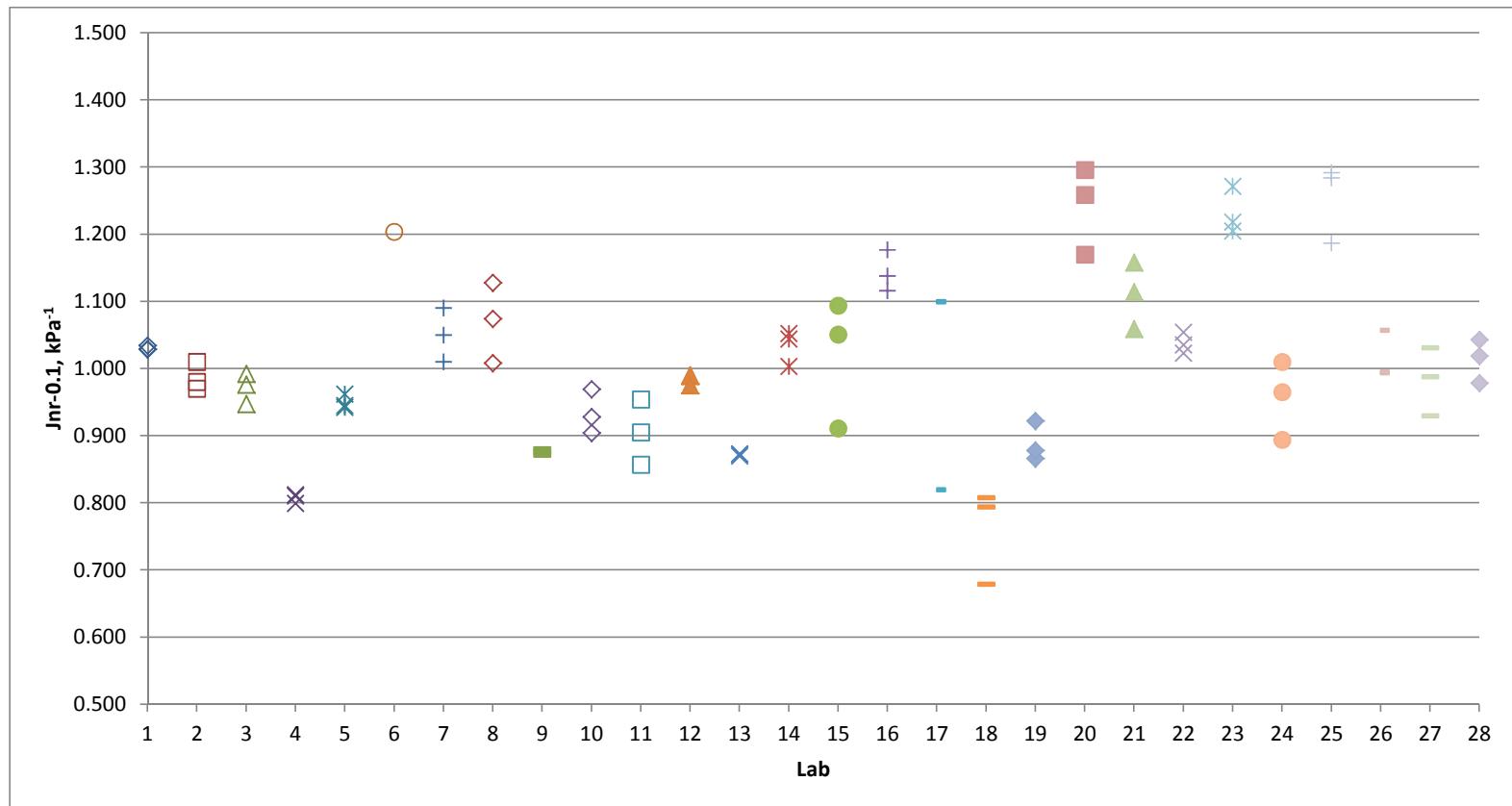
PG 64-28 (58C)

Jnr (0.1 kPa)

Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		1.029	1.035	1.029	1.03077	0.00323	0.03937	0.28	0.02
2		0.980	0.970	1.010	0.98667	0.02082	-0.00473	-0.03	0.13
3		0.992	0.947	0.976	0.97167	0.02281	-0.01973	-0.14	0.14
4		0.812	0.799	0.810	0.80727	0.00704	-0.18413	-1.33	0.04
5		0.962	0.942	0.945	0.94967	0.01079	-0.04173	-0.30	0.07
6		1.204	0.051		0.62750	0.81529	-0.36389	-2.63	5.02
7		1.090	1.010	1.050	1.05000	0.04000	0.05861	0.42	0.25
8		1.074	1.128	1.008	1.07000	0.06010	0.07861	0.57	0.37
9		0.876	0.881	0.871	0.87600	0.00500	-0.11539	-0.83	0.03
10		0.928	0.904	0.969	0.93367	0.03287	-0.05773	-0.42	0.20
11		0.954	0.905	0.857	0.90533	0.04850	-0.08606	-0.62	0.30
12		0.989	0.990	0.975	0.98467	0.00839	-0.00673	-0.05	0.05
13		0.872	0.870	0.873	0.87167	0.00153	-0.11973	-0.87	0.01
14		1.052	1.044	1.003	1.03300	0.02629	0.04161	0.30	0.16
15		1.094	1.051	0.911	1.01867	0.09569	0.02727	0.20	0.59
16		1.177	1.138	1.116	1.14367	0.03089	0.15227	1.10	0.19
17		1.100	1.100	0.820	1.00667	0.16166	0.01527	0.11	1.00
18		0.794	0.808	0.679	0.76033	0.07078	-0.23106	-1.67	0.44
19		0.922	0.866	0.878	0.88867	0.02948	-0.10273	-0.74	0.18
20		1.170	1.296	1.259	1.24167	0.06476	0.25027	1.81	0.40
21		1.114	1.059	1.158	1.11033	0.04960	0.11894	0.86	0.31
22		1.035	1.023	1.054	1.03733	0.01563	0.04594	0.33	0.10
23		1.271	1.205	1.218	1.23133	0.03496	0.23994	1.74	0.22
24		1.010	0.965	0.894	0.95633	0.05848	-0.03506	-0.25	0.36
25		1.187	1.284	1.292	1.25433	0.05845	0.26294	1.90	0.36
26		0.994	0.995	1.057	1.01533	0.03609	0.02394	0.17	0.22
27		0.988	1.031	0.930	0.98300	0.05069	-0.00839	-0.06	0.31
28		1.043	0.979	1.019	1.01344	0.03262	0.02204	0.16	0.20

Average of Cell Averages
 Standard Deviation of Cell Averages
 Repeatability Standard Deviation
 Reproducibility Standard Deviation

X-bar	0.991
s _{X-bar}	0.138
s _r	0.16227
s _R	0.191



Binder C

PG 64-28 (58C)

Jnr (3.2 kPa)

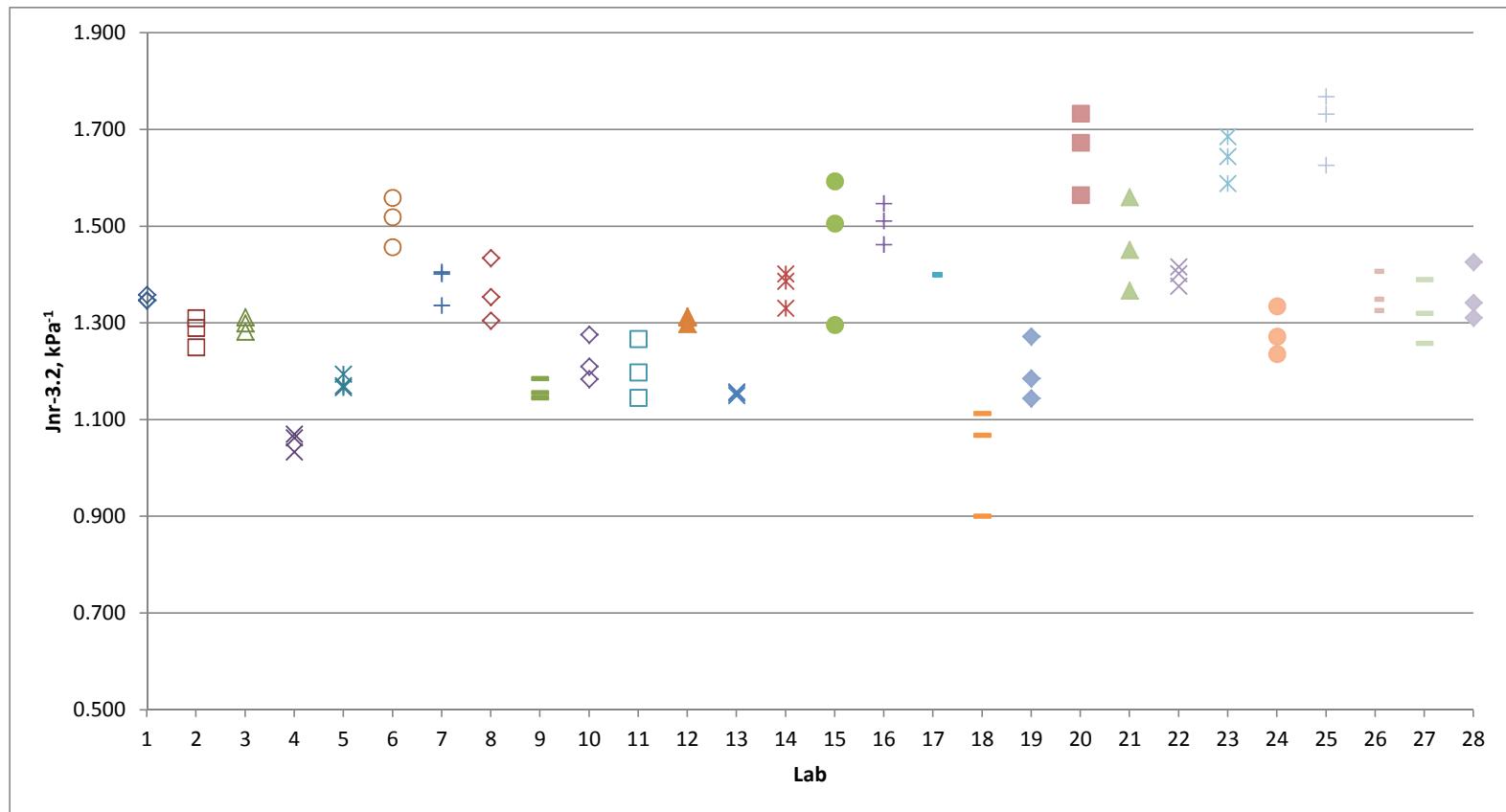
Lab No.	Lab Name	Results, x					h	k
		1	2	3	Average	s		
1		1.347	1.358	1.347	1.35057	0.00670	0.00673	0.04
2		1.290	1.250	1.310	1.28333	0.03055	-0.06050	-0.36
3		1.299	1.282	1.312	1.29767	0.01504	-0.04617	-0.28
4		1.062	1.033	1.070	1.05500	0.01947	-0.28883	-1.72
5		1.194	1.166	1.170	1.17667	0.01514	-0.16717	-1.00
6		1.559	1.457	1.519	1.51167	0.05139	0.16783	1.00
7		1.401	1.336	1.405	1.38067	0.03873	0.03683	0.22
8		1.354	1.434	1.305	1.36433	0.06512	0.02050	0.12
9		1.156	1.185	1.145	1.16200	0.02066	-0.18183	-1.09
10		1.210	1.184	1.276	1.22333	0.04743	-0.12050	-0.72
11		1.267	1.198	1.145	1.20333	0.06117	-0.14050	-0.84
12		1.314	1.311	1.298	1.30767	0.00850	-0.03617	-0.22
13		1.154	1.157	1.150	1.15367	0.00351	-0.19017	-1.14
14		1.401	1.386	1.330	1.37233	0.03742	0.02850	0.17
15		1.593	1.506	1.296	1.46500	0.15269	0.12117	0.72
16		1.547	1.511	1.462	1.50667	0.04267	0.16283	0.97
17		1.400	1.400	1.400	1.40000	0.00000	0.05617	0.34
18		1.113	1.068	0.901	1.02733	0.11170	-0.31650	-1.89
19		1.272	1.144	1.185	1.20033	0.06536	-0.14350	-0.86
20		1.565	1.733	1.673	1.65700	0.08514	0.31317	1.87
21		1.451	1.367	1.560	1.45933	0.09677	0.11550	0.69
22		1.402	1.376	1.416	1.39800	0.02030	0.05417	0.32
23		1.644	1.588	1.685	1.63900	0.04869	0.29517	1.76
24		1.335	1.272	1.236	1.28100	0.05011	-0.06283	-0.38
25		1.626	1.732	1.768	1.70867	0.07382	0.36483	2.18
26		1.349	1.326	1.407	1.36067	0.04174	0.01683	0.10
27		1.320	1.390	1.258	1.32267	0.06604	-0.02117	-0.13
28		1.426	1.310	1.342	1.35943	0.05989	0.01560	0.09

Average of Cell Averages X-bar 1.344

Standard Deviation of Cell Averages S_{X-bar} 0.167

Repeatability Standard Deviation S_r 0.05887 0.174

Reproducibility Standard Deviation S_R 0.174



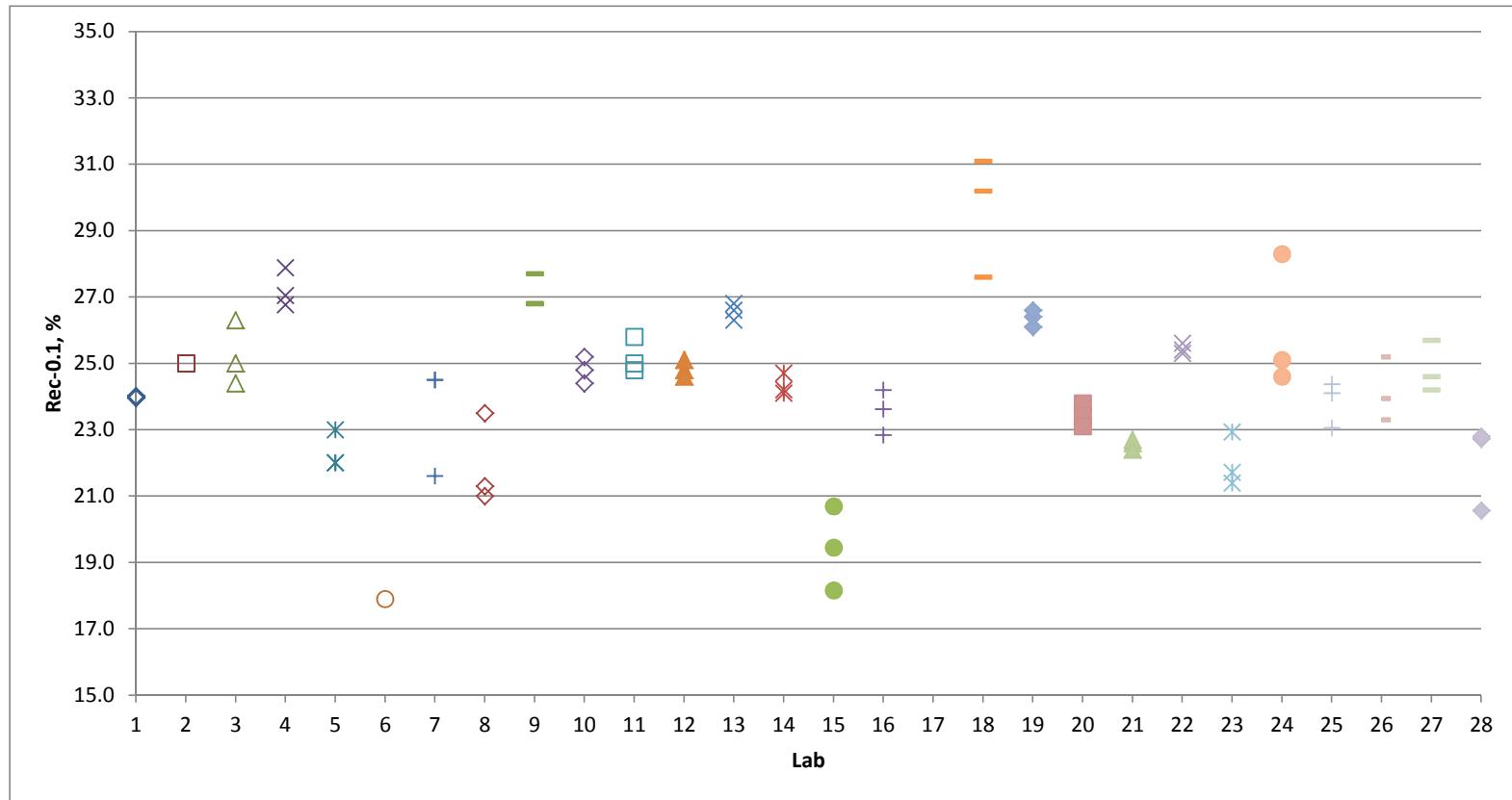
Binder C

PG 64-28 (58C)**Recovery (0.1 kPa)**

Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		24.0	24.0	24.0	23.980	0.035	-0.215	-0.09	0.04
2		25.0	25.0	25.0	25.000	0.000	0.805	0.33	0.00
3		24.4	26.3	25.0	25.233	0.971	1.039	0.43	1.08
4		27.0	26.8	27.9	27.227	0.583	3.032	1.26	0.65
5		22.0	23.0	22.0	22.333	0.577	-1.861	-0.77	0.64
6		17.9			17.900		-6.295	-2.61	0.00
7		21.6	24.5	24.5	23.533	1.674	-0.661	-0.27	1.86
8		21.3	21.0	23.5	21.933	1.365	-2.261	-0.94	1.51
9		26.8	27.7	26.8	27.100	0.520	2.905	1.21	0.58
10		24.8	25.2	24.4	24.800	0.400	0.605	0.25	0.44
11		24.8	25.0	25.8	25.200	0.529	1.005	0.42	0.59
12		24.8	24.6	25.1	24.833	0.252	0.639	0.27	0.28
13		26.6	26.8	26.3	26.567	0.252	2.372	0.98	0.28
14		24.1	24.2	24.7	24.333	0.321	0.139	0.06	0.36
15		18.2	19.5	20.7	19.433	1.265	-4.761	-1.98	1.40
16		22.8	23.6	24.2	23.550	0.678	-0.645	-0.27	0.75
17									
18		31.1	27.6	30.2	29.633	1.818	5.439	2.26	2.02
19		26.1	26.4	26.6	26.367	0.252	2.172	0.90	0.28
20		23.8	23.4	23.1	23.440	0.340	-0.755	-0.31	0.38
21		22.6	22.7	22.4	22.567	0.153	-1.628	-0.68	0.17
22		25.4	25.6	25.3	25.433	0.153	1.239	0.51	0.17
23		21.4	21.7	22.9	22.010	0.813	-2.185	-0.91	0.90
24		24.6	25.1	28.3	26.000	2.007	1.805	0.75	2.23
25		24.4	23.1	24.1	23.840	0.697	-0.355	-0.15	0.77
26		25.2	23.9	23.3	24.147	0.967	-0.048	-0.02	1.07
27		24.6	24.2	25.7	24.833	0.777	0.639	0.27	0.86
28		22.7	22.8	20.6	22.028	1.265	-2.167	-0.90	1.40

Average of Cell Averages X-bar 24.195

Standard Deviation of Cell Averages S_{X-bar} 2.409Repeatability Standard Deviation S_r 0.90147 2.519Reproducibility Standard Deviation S_R 2.519



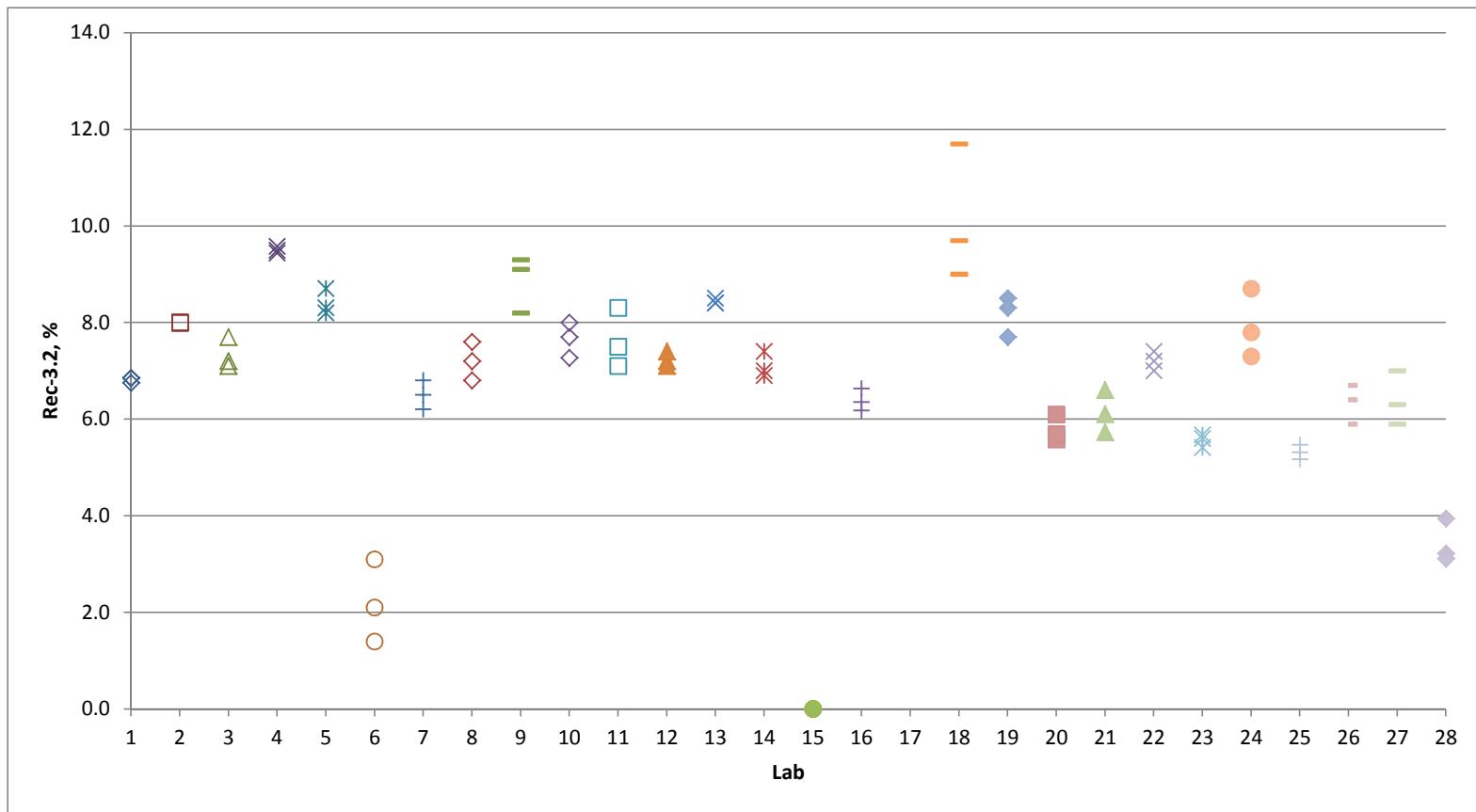
Binder C

PG 64-28 (58C)**Recovery (3.2 kPa)**

Lab No.	Lab Name	Results, x								
		1	2	3	Average	s	d	h	k	
1		6.9	6.8	6.9	6.81667	0.05774	0.08840	0.04	0.12	
2		8.0	8.0	8.0	8.00000	0.00000	1.27173	0.59	0.00	
3		7.1	7.7	7.2	7.33333	0.32146	0.60507	0.28	0.69	
4		9.4	9.6	9.5	9.50333	0.06730	2.77507	1.30	0.14	
5		8.2	8.7	8.3	8.40000	0.26458	1.67173	0.78	0.57	
6		2.1	3.1	1.4	2.20000	0.85440	-4.52827	-2.11	1.84	
7		6.5	6.8	6.2	6.50000	0.30000	-0.22827	-0.11	0.65	
8		7.2	6.8	7.6	7.20000	0.40000	0.47173	0.22	0.86	
9		9.1	8.2	9.3	8.86667	0.58595	2.13840	1.00	1.26	
10		7.7	8.0	7.3	7.65667	0.36692	0.92840	0.43	0.79	
11		7.1	7.5	8.3	7.63333	0.61101	0.90507	0.42	1.32	
12		7.2	7.1	7.4	7.23333	0.15275	0.50507	0.24	0.33	
13		8.4	8.4	8.5	8.43333	0.05774	1.70507	0.80	0.12	
14		6.9	7.0	7.4	7.10000	0.26458	0.37173	0.17	0.57	
15		0.0	0.0	0.0	0.00000	0.00000	-6.72827	-3.14	0.00	
16		6.2	6.4	6.6	6.38667	0.22723	-0.34160	-0.16	0.49	
17										
18		9.0	9.7	11.7	10.13333	1.40119	3.40507	1.59	3.02	
19		7.7	8.5	8.3	8.16667	0.41633	1.43840	0.67	0.90	
20		6.1	5.6	5.7	5.79067	0.27199	-0.93760	-0.44	0.59	
21		6.1	6.6	5.7	6.14333	0.43662	-0.58493	-0.27	0.94	
22		7.2	7.4	7.0	7.20000	0.20000	0.47173	0.22	0.43	
23		5.4	5.7	5.6	5.56000	0.13454	-1.16827	-0.55	0.29	
24		7.3	7.8	8.7	7.93333	0.70946	1.20507	0.56	1.53	
25		5.5	5.3	5.2	5.31667	0.15005	-1.41160	-0.66	0.32	
26		6.7	6.4	5.9	6.33333	0.40415	-0.39493	-0.18	0.87	
27		6.3	5.9	7.0	6.40000	0.55678	-0.32827	-0.15	1.20	
28		3.2	3.9	3.1	3.42250	0.45049	-3.30576	-1.54	0.97	

Average of Cell Averages
 Standard Deviation of Cell Averages
 Repeatability Standard Deviation
 Reproducibility Standard Deviation

X-bar	6.728
S _{X-bar}	2.142
S _r	0.46437
S _R	2.176



Binder C

PG 64-28 (58C)

Jnr-Diff

Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		30.880	31.300	30.880	31.02000	0.24249	-2.02132	-0.44	0.04
2		31.633	28.866	29.703	30.06720	1.41884	-2.97412	-0.64	0.26
3		30.965	35.329	34.389	33.56100	2.29680	0.51968	0.11	0.42
4		30.700	29.270	32.020	30.66333	1.37537	-2.37799	-0.51	0.25
5		19.380	19.220	19.250	19.28333	0.08505	-13.75799	-2.98	0.02
6		29.560			29.56000		-3.48132	-0.75	0.00
7		28.559	32.451	33.832	31.61400	2.73433	-1.42732	-0.31	0.50
8		26.040	27.160	29.520	27.57333	1.77644	-5.46799	-1.18	0.33
9		32.040	34.560	31.460	32.68667	1.64807	-0.35465	-0.08	0.30
10		30.350	30.879	31.532	30.92033	0.59208	-2.12099	-0.46	0.11
11		32.772	32.337	33.655	32.92133	0.67157	-0.11999	-0.03	0.12
12		32.863	32.423	33.153	32.81300	0.36756	-0.22832	-0.05	0.07
13		32.366	32.947	31.800	32.37100	0.57352	-0.67032	-0.15	0.11
14		33.203	32.890	32.628	32.90700	0.28788	-0.13432	-0.03	0.05
15		41.020	43.290	42.300	42.20333	1.13808	9.16201	1.98	0.21
16		31.375	32.843	31.024	31.74733	0.96497	-1.29399	-0.28	0.18
17		31.900	32.400	77.700	47.33333	26.29949	14.29201	3.09	4.83
18		40.180	32.201	32.640	35.00700	4.48532	1.96568	0.43	0.82
19		37.934	32.090	34.941	34.98833	2.92229	1.94701	0.42	0.54
20		33.750	33.730	32.900	33.46000	0.48508	0.41868	0.09	0.09
21		30.300	29.100	35.100	31.50000	3.17490	-1.54132	-0.33	0.58
22		35.468	34.646	34.395	34.83633	0.56125	1.79501	0.39	0.10
23		29.382	31.745	38.352	33.15967	4.64932	0.11835	0.03	0.85
24		32.160	31.820	38.190	34.05667	3.58361	1.01535	0.22	0.66
25		36.900	34.880	36.780	36.18667	1.13320	3.14535	0.68	0.21
26		35.610	33.235	33.153	33.99933	1.39548	0.95801	0.21	0.26
27		33.700	34.900	35.200	34.60000	0.79373	1.55868	0.34	0.15
28		36.726	33.917	31.710	34.11744	2.51387	1.07612	0.23	0.46

Average of Cell Averages

X-bar 33.041

Standard Deviation of Cell Averages

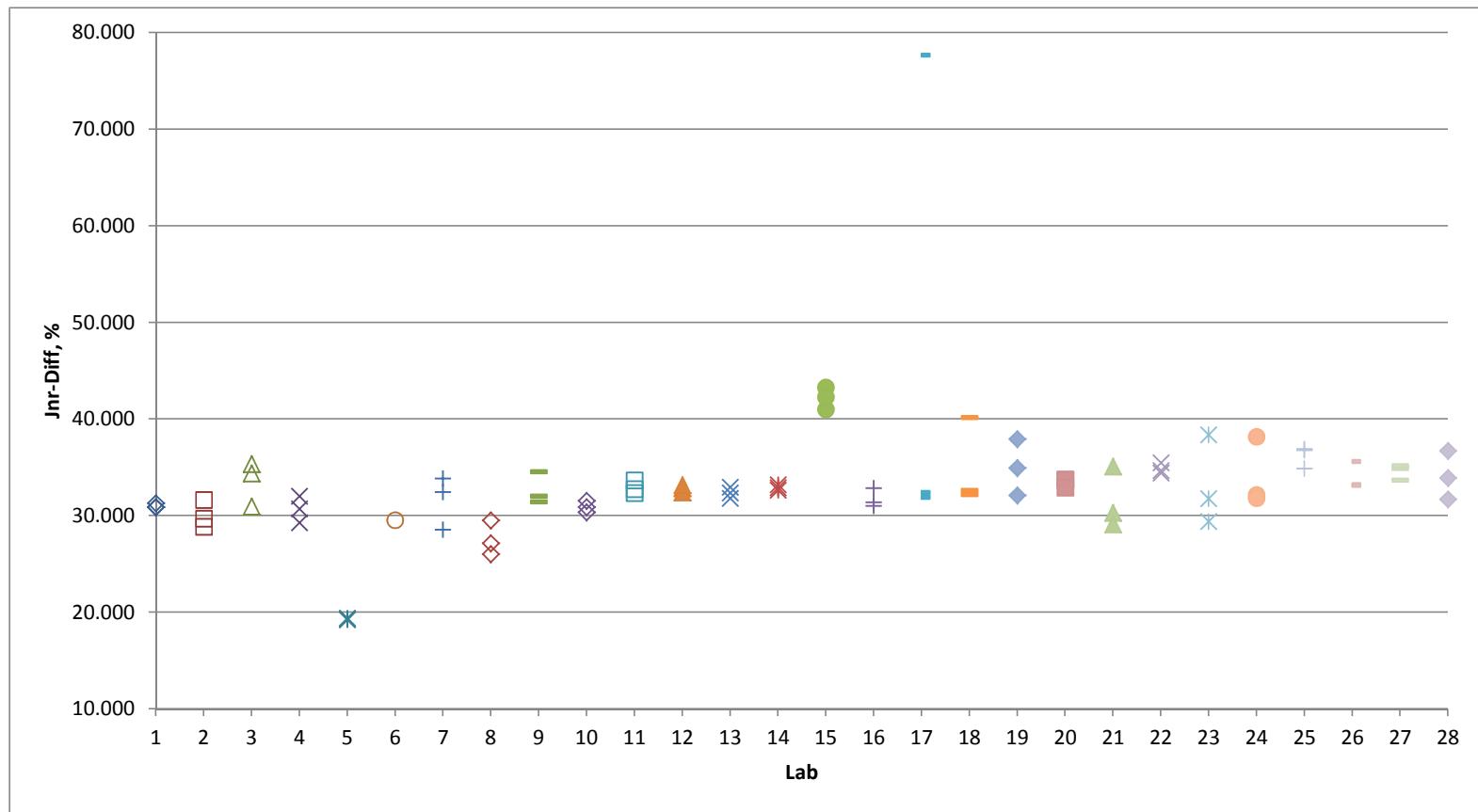
s_{X-bar} 4.619

Repeatability Standard Deviation

s_r 5.44930 6.414

Reproducibility Standard Deviation

s_R 6.414



Binder C64
PG 64-28 (64C)

Jnr (0.1 kPa)

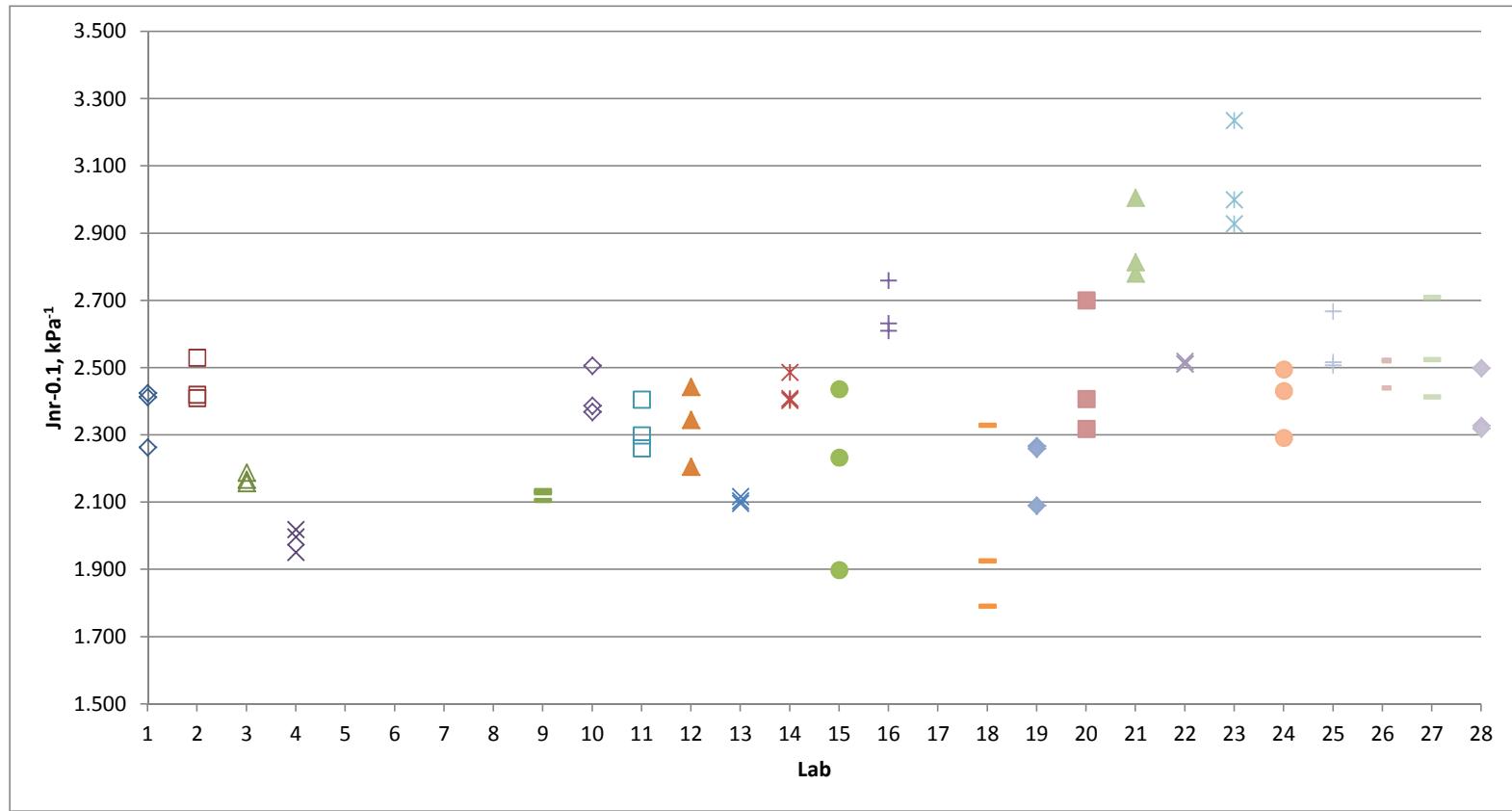
Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		2.263	2.425	2.412	2.36683	0.09015	-0.02877	-0.11	0.74
2		2.420	2.410	2.530	2.45333	0.06658	0.05773	0.23	0.54
3		2.167	2.157	2.188	2.17067	0.01582	-0.22494	-0.88	0.13
4		2.019	1.997	1.951	1.98900	0.03470	-0.40661	-1.60	0.28
5									
6									
7									
8									
9		2.129	2.135	2.106	2.12333	0.01531	-0.27227	-1.07	0.12
10		2.506	2.387	2.369	2.42067	0.07445	0.02506	0.10	0.61
11		2.261	2.299	2.405	2.32167	0.07463	-0.07394	-0.29	0.61
12		2.443	2.345	2.206	2.33133	0.11909	-0.06427	-0.25	0.97
13		2.097	2.117	2.104	2.10600	0.01015	-0.28961	-1.14	0.08
14		2.408	2.486	2.403	2.43233	0.04654	0.03673	0.14	0.38
15		2.233	1.899	2.437	2.18967	0.27161	-0.20594	-0.81	2.22
16		2.610	2.759	2.632	2.66700	0.08043	0.27139	1.07	0.66
17									
18		1.926	1.791	2.329	2.01533	0.27990	-0.38027	-1.49	2.28
19		2.267	2.260	2.090	2.20567	0.10023	-0.18994	-0.75	0.82
20		2.701	2.318	2.407	2.47533	0.20044	0.07973	0.31	1.64
21		2.780	2.814	3.006	2.86667	0.12186	0.47106	1.85	0.99
22		2.512	2.511	2.519	2.51400	0.00436	0.11839	0.47	0.04
23		3.235	2.928	2.999	3.05400	0.16072	0.65839	2.59	1.31
24		2.495	2.292	2.431	2.40600	0.10378	0.01039	0.04	0.85
25		2.668	2.507	2.516	2.56367	0.09047	0.16806	0.66	0.74
26		2.521	2.523	2.440	2.49467	0.04735	0.09906	0.39	0.39
27		2.414	2.710	2.525	2.54967	0.14953	0.15406	0.61	1.22
28		2.499	2.328	2.320	2.38213	0.10137	-0.01347	-0.05	0.83

Average of Cell Averages X-bar 2.396

Standard Deviation of Cell Averages S_{X-bar} 0.254

Repeatability Standard Deviation S_r 0.12250 0.273

Reproducibility Standard Deviation S_R 0.273



Binder C64

PG 64-28 (64C)

Jnr (3.2 kPa)

Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		3.104	3.291	3.282	3.22567	0.10545	-0.08914	-0.27	0.57
2		3.220	3.270	3.440	3.31000	0.11533	-0.00480	-0.01	0.62
3		3.058	3.017	3.051	3.04200	0.02193	-0.27280	-0.84	0.12
4		2.738	2.721	2.670	2.70967	0.03539	-0.60514	-1.87	0.19
5									
6									
7									
8									
9		2.973	3.011	2.916	2.96667	0.04782	-0.34814	-1.07	0.26
10		3.389	3.237	3.231	3.28567	0.08954	-0.02914	-0.09	0.48
11		3.157	3.196	3.283	3.21200	0.06451	-0.10280	-0.32	0.35
12		3.420	3.202	3.077	3.23300	0.17359	-0.08180	-0.25	0.94
13		2.944	2.955	2.954	2.95100	0.00608	-0.36380	-1.12	0.03
14		3.279	3.445	3.355	3.35967	0.08310	0.04486	0.14	0.45
15		3.539	2.763	3.704	3.33533	0.50247	0.02053	0.06	2.72
16		3.562	3.754	3.686	3.66733	0.09735	0.35253	1.09	0.53
17									
18		2.591	2.610	3.323	2.84133	0.41724	-0.47347	-1.46	2.26
19		3.122	3.103	2.866	3.03033	0.14263	-0.28447	-0.88	0.77
20		3.730	3.220	3.310	3.42000	0.27221	0.10520	0.32	1.47
21		3.717	3.737	3.990	3.81467	0.15217	0.49986	1.54	0.82
22		3.471	3.534	3.510	3.50500	0.03180	0.19020	0.59	0.17
23		4.492	4.002	4.039	4.17767	0.27285	0.86286	2.66	1.48
24		3.469	3.255	3.389	3.37100	0.10813	0.05620	0.17	0.59
25		3.708	3.480	3.478	3.55533	0.13222	0.24053	0.74	0.72
26		3.433	3.468	3.373	3.42467	0.04805	0.10986	0.34	0.26
27		3.365	3.732	3.486	3.52767	0.18701	0.21286	0.66	1.01
28		3.397	3.222	3.205	3.27483	0.10606	-0.03997	-0.12	0.57

Average of Cell Averages

X-bar 3.315

Standard Deviation of Cell Averages

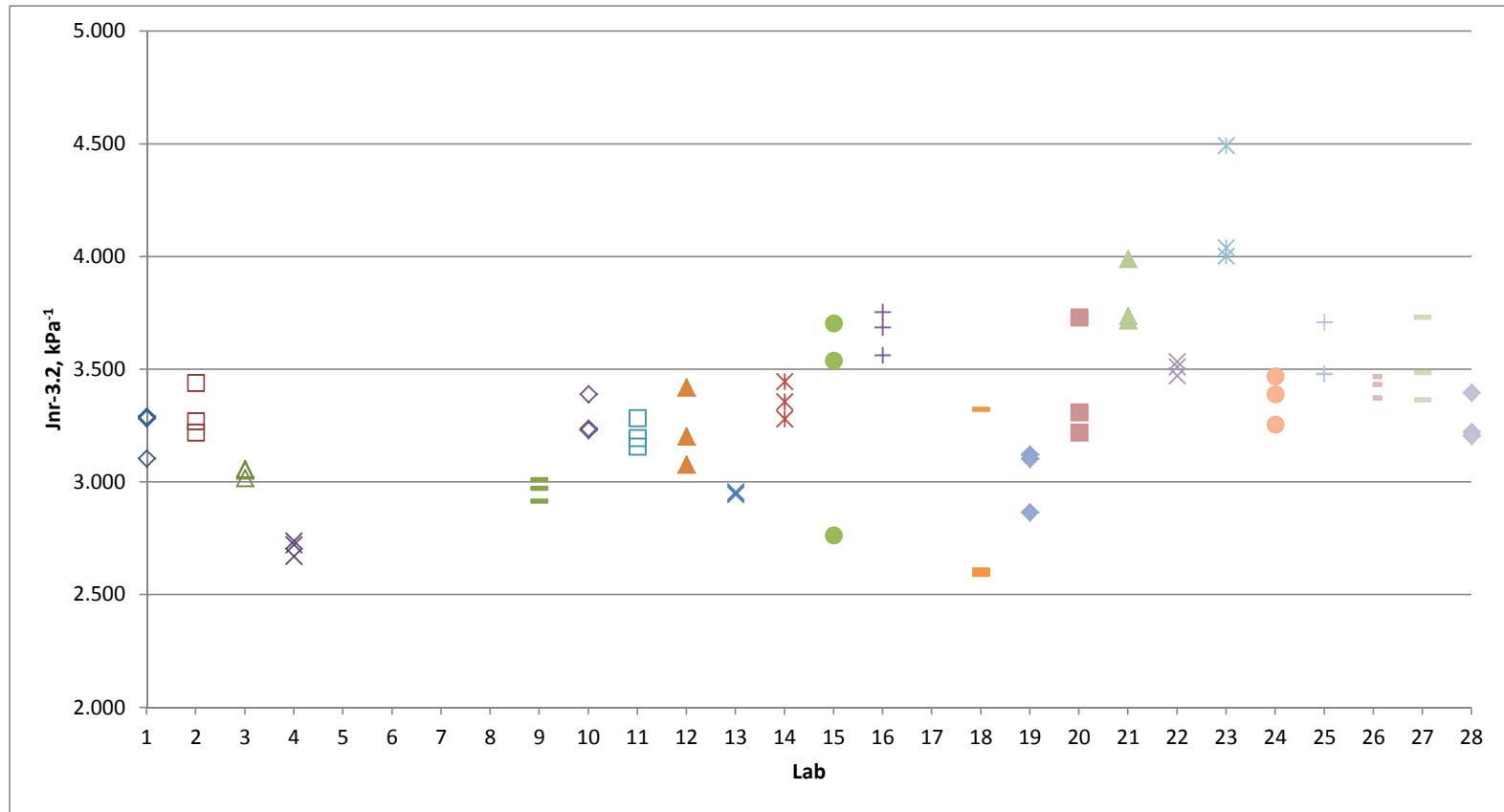
s_{X-bar} 0.324

Repeatability Standard Deviation

s_r 0.18469 0.358

Reproducibility Standard Deviation

s_R 0.358



Binder C64

PG 64-28 (64C)

Recovery (0.1 kPa)

Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		17.7	16.5	16.9	17.030	0.603	-0.074	-0.04	0.67
2		18.0	18.0	18.0	18.000	0.000	0.896	0.49	0.00
3		18.9	18.8	18.6	18.767	0.153	1.662	0.90	0.17
4		19.0	18.7	19.1	18.933	0.247	1.829	0.99	0.27
5									
6									
7									
8									
9		19.5	20.3	19.4	19.733	0.493	2.629	1.43	0.54
10		15.7	16.3	16.6	16.200	0.458	-0.904	-0.49	0.51
11		17.6	17.2	16.4	17.067	0.611	-0.038	-0.02	0.67
12		17.3	17.0	18.4	17.567	0.737	0.462	0.25	0.81
13		19.2	18.9	19.1	19.067	0.153	1.962	1.07	0.17
14		16.7	16.6	17.2	16.833	0.321	-0.271	-0.15	0.35
15		12.2	14.2	16.3	14.223	2.025	-2.881	-1.57	2.23
16		16.8	16.2	16.5	16.493	0.321	-0.611	-0.33	0.35
17									
18		17.6	23.3	19.5	20.133	2.902	3.029	1.65	3.20
19		17.7	17.7	18.4	17.933	0.404	0.829	0.45	0.45
20		16.9	18.8	17.9	17.870	0.947	0.766	0.42	1.04
21		14.5	14.1	13.3	13.967	0.611	-3.138	-1.71	0.67
22		17.9	17.6	17.7	17.733	0.153	0.629	0.34	0.17
23		13.7	15.1	14.2	14.343	0.719	-2.761	-1.50	0.79
24		17.8	19.1	17.7	18.200	0.781	1.096	0.60	0.86
25		16.8	18.1	17.9	17.563	0.713	0.459	0.25	0.79
26		16.0	16.2	16.8	16.333	0.416	-0.771	-0.42	0.46
27		17.1	15.9	15.9	16.300	0.693	-0.804	-0.44	0.76
28		12.2	13.5	13.6	13.110	0.769	-3.994	-2.17	0.85

Average of Cell Averages

X-bar 17.104

Standard Deviation of Cell Averages

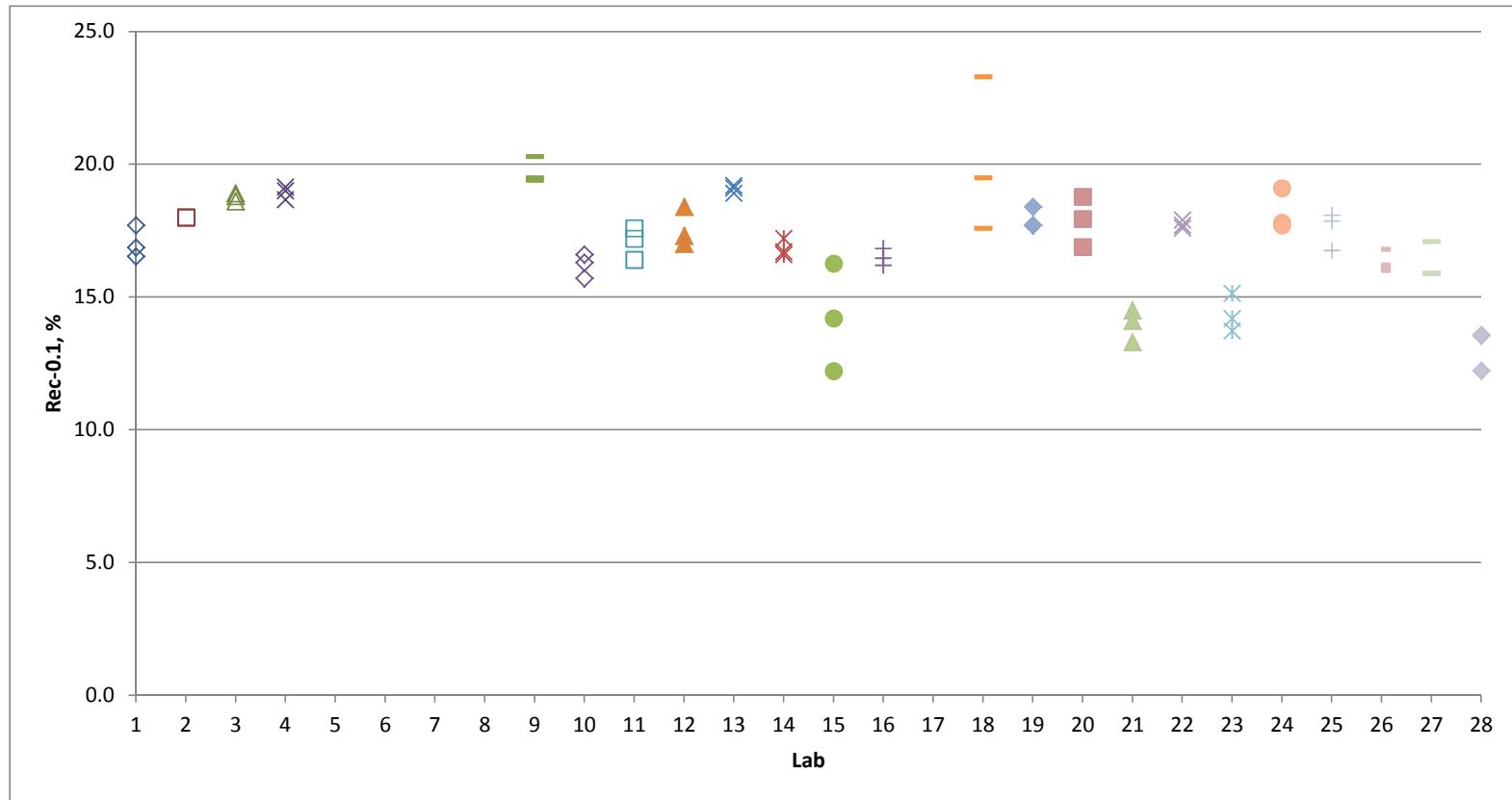
s_{X-bar} 1.839

Repeatability Standard Deviation

s_r 0.90671 1.982

Reproducibility Standard Deviation

s_R 1.982



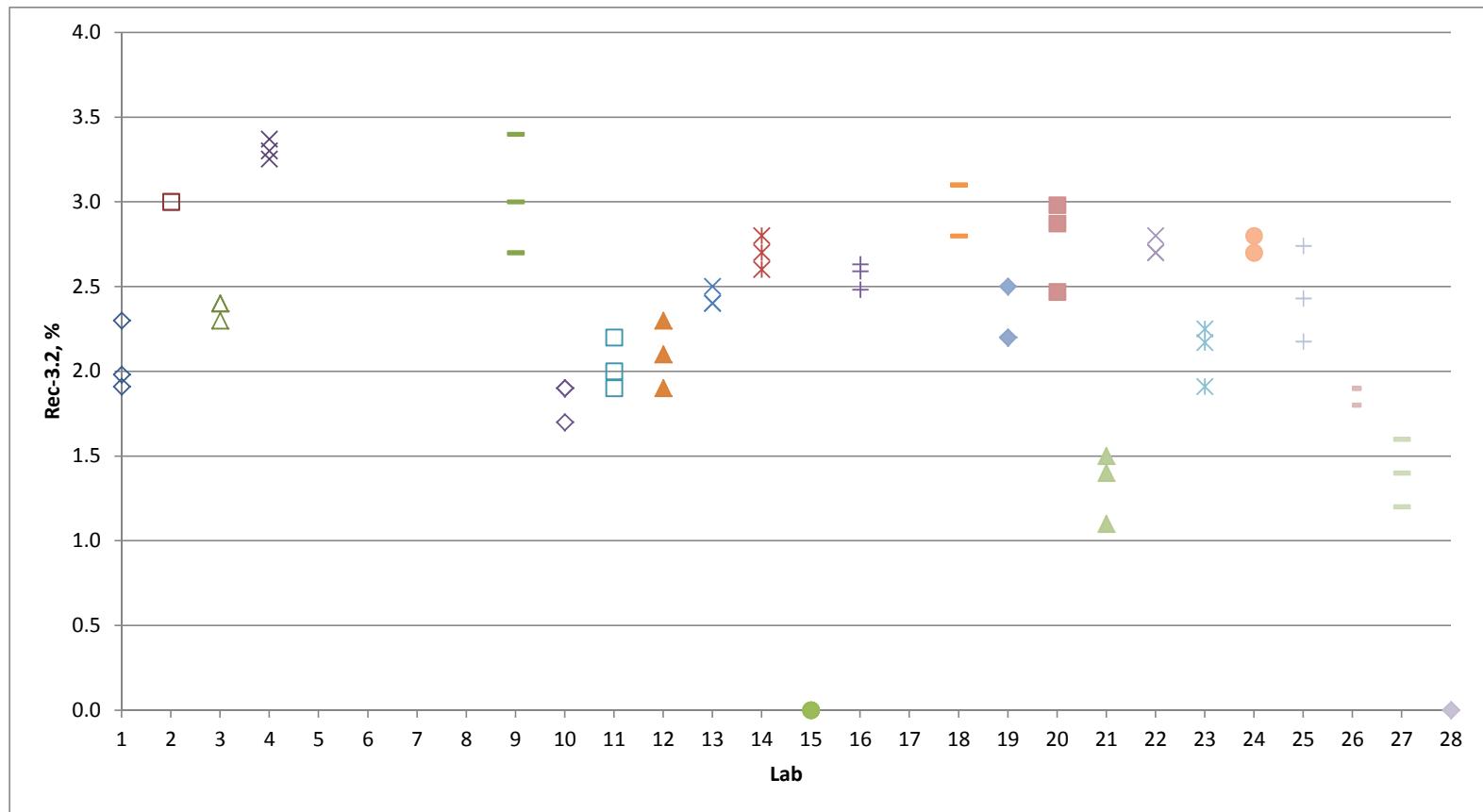
Binder C64

PG 64-28 (64C)

Recovery (3.2 kPa)

Lab No.	Lab Name	Results, x					h	k
		1	2	3	Average	s		
1		2.3	1.9	2.0	2.06333	0.20793	-0.11648	-0.14
2		3.0	3.0	3.0	3.00000	0.00000	0.82019	0.96
3		2.3	2.4	2.4	2.36667	0.05774	0.18686	0.22
4		3.3	3.3	3.4	3.30667	0.05928	1.12686	1.32
5								0.36
6								
7								
8								
9		3.4	2.7	3.0	3.03333	0.35119	0.85352	1.00
10		1.7	1.9	1.9	1.83333	0.11547	-0.34648	-0.41
11		1.9	2.2	2.0	2.03333	0.15275	-0.14648	-0.17
12		1.9	2.1	2.3	2.10000	0.20000	-0.07981	-0.09
13		2.5	2.4	2.4	2.43333	0.05774	0.25352	0.30
14		2.8	2.6	2.7	2.70000	0.10000	0.52019	0.61
15		0.0	0.0	0.0	0.00000	0.00000	-2.17981	-2.56
16		2.6	2.5	2.6	2.56667	0.07767	0.38686	0.45
17								0.48
18		3.1	3.1	2.8	3.00000	0.17321	0.82019	0.96
19		2.2	2.2	2.5	2.30000	0.17321	0.12019	0.14
20		2.5	3.0	2.9	2.77467	0.27027	0.59486	0.70
21		1.5	1.4	1.1	1.33333	0.20817	-0.84648	-0.99
22		2.8	2.7	2.7	2.73333	0.05774	0.55352	0.65
23		1.9	2.3	2.2	2.11000	0.17776	-0.06981	-0.08
24		2.7	2.8	2.7	2.73333	0.05774	0.55352	0.65
25		2.2	2.7	2.4	2.44767	0.28291	0.26786	0.31
26		1.9	1.8	1.9	1.86667	0.05774	-0.31314	-0.37
27		1.6	1.2	1.4	1.40000	0.20000	-0.77981	-0.91
28		0.0	0.0	0.0	0.00000	0.00000	-2.17981	-2.56
Average of Cell Averages		X-bar		2.180				
Standard Deviation of Cell Averages		S _{X-bar}		0.853				
Repeatability Standard Deviation		S _r		0.16252	0.863			
Reproducibility Standard Deviation		S _R		0.863				

Average of Cell Averages
 Standard Deviation of Cell Averages
 Repeatability Standard Deviation
 Reproducibility Standard Deviation

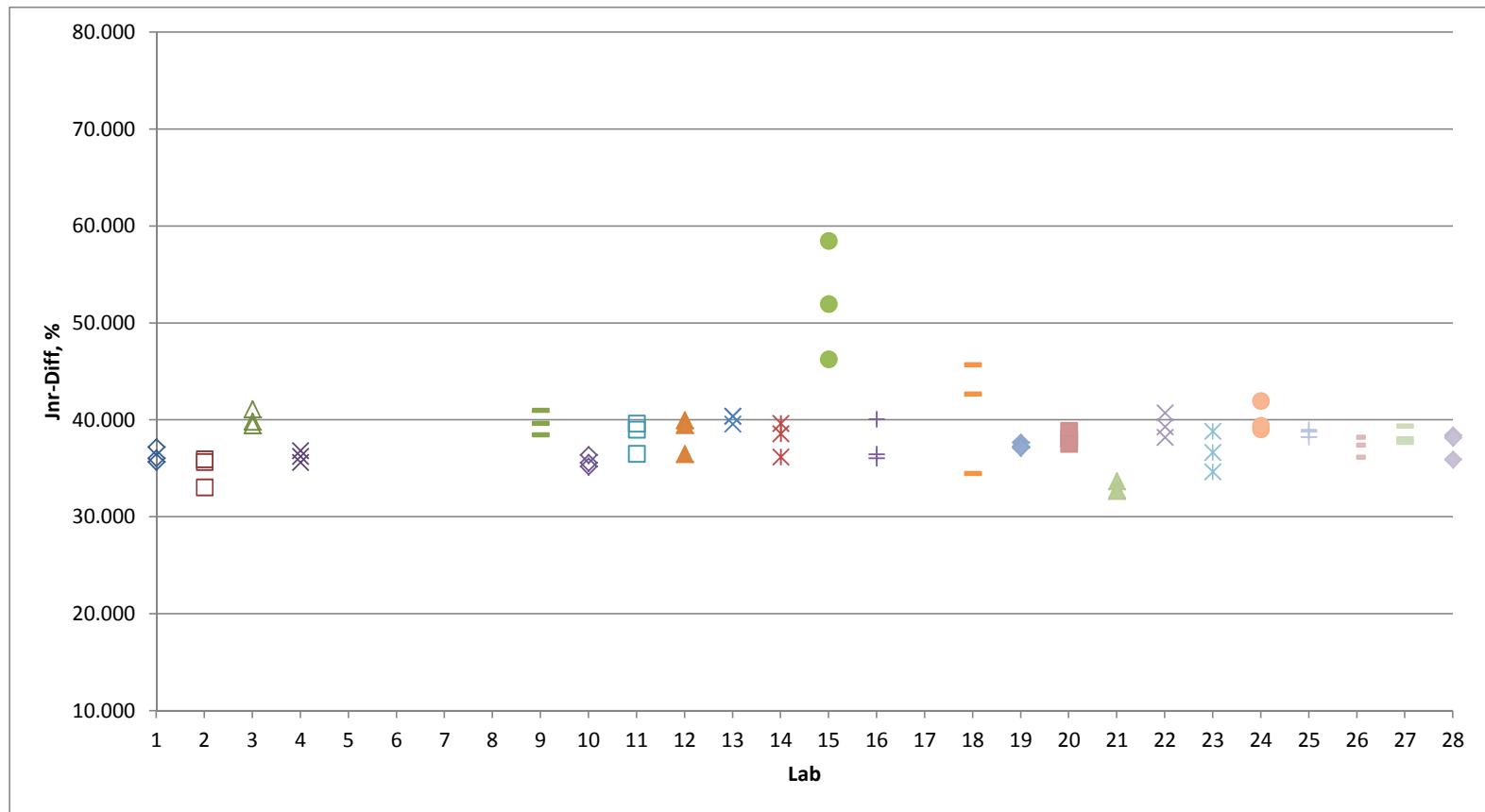


Binder C64
PG 64-28 (64C)

Jnr-Diff

Lab No.	Lab Name	Results, x								
		1	2	3	Average	s	d	h	k	
1		37.200	35.690	36.050	36.31333	0.78869	-2.20550	-0.63	0.37	
2		33.058	35.685	35.968	34.90363	1.60477	-3.61521	-1.02	0.75	
3		41.115	39.832	39.445	40.13067	0.87414	1.61184	0.46	0.41	
4		35.630	36.250	36.850	36.24333	0.61003	-2.27550	-0.64	0.29	
5										
6										
7										
8										
9		39.660	41.010	38.480	39.71667	1.26595	1.19784	0.34	0.59	
10		35.232	35.593	36.402	35.74233	0.59912	-2.77650	-0.79	0.28	
11		39.657	39.006	36.527	38.39667	1.65157	-0.12216	-0.03	0.77	
12		39.998	36.510	39.500	38.66933	1.88654	0.15050	0.04	0.88	
13		40.397	39.587	40.406	40.13000	0.47027	1.61117	0.46	0.22	
14		36.181	38.590	39.629	38.13333	1.76878	-0.38550	-0.11	0.83	
15		58.500	46.290	51.990	52.26000	6.10948	13.74117	3.89	2.86	
16		36.480	36.066	40.072	37.53933	2.20310	-0.97950	-0.28	1.03	
17										
18		34.500	45.705	42.709	40.97133	5.80109	2.45250	0.70	2.71	
19		37.695	37.289	37.144	37.37600	0.28562	-1.14283	-0.32	0.13	
20		38.090	38.880	37.550	38.17333	0.66890	-0.34550	-0.10	0.31	
21		33.700	32.800	32.700	33.06667	0.55076	-5.45216	-1.55	0.26	
22		38.199	40.746	39.313	39.41933	1.27683	0.90050	0.26	0.60	
23		38.845	36.662	34.659	36.72200	2.09364	-1.79683	-0.51	0.98	
24		39.040	41.980	39.410	40.14333	1.60132	1.62450	0.46	0.75	
25		38.980	38.810	38.250	38.68000	0.38197	0.16117	0.05	0.18	
26		36.178	37.444	38.245	37.28900	1.04218	-1.22983	-0.35	0.49	
27		39.400	37.700	38.100	38.40000	0.88882	-0.11883	-0.03	0.42	
28		35.925	38.437	38.178	37.51349	1.38170	-1.00534	-0.28	0.65	

Average of Cell Averages	X-bar	38.519
Standard Deviation of Cell Averages	S _{X-bar}	3.528
Repeatability Standard Deviation	S _r	2.13770 3.936
Reproducibility Standard Deviation	S _R	3.936



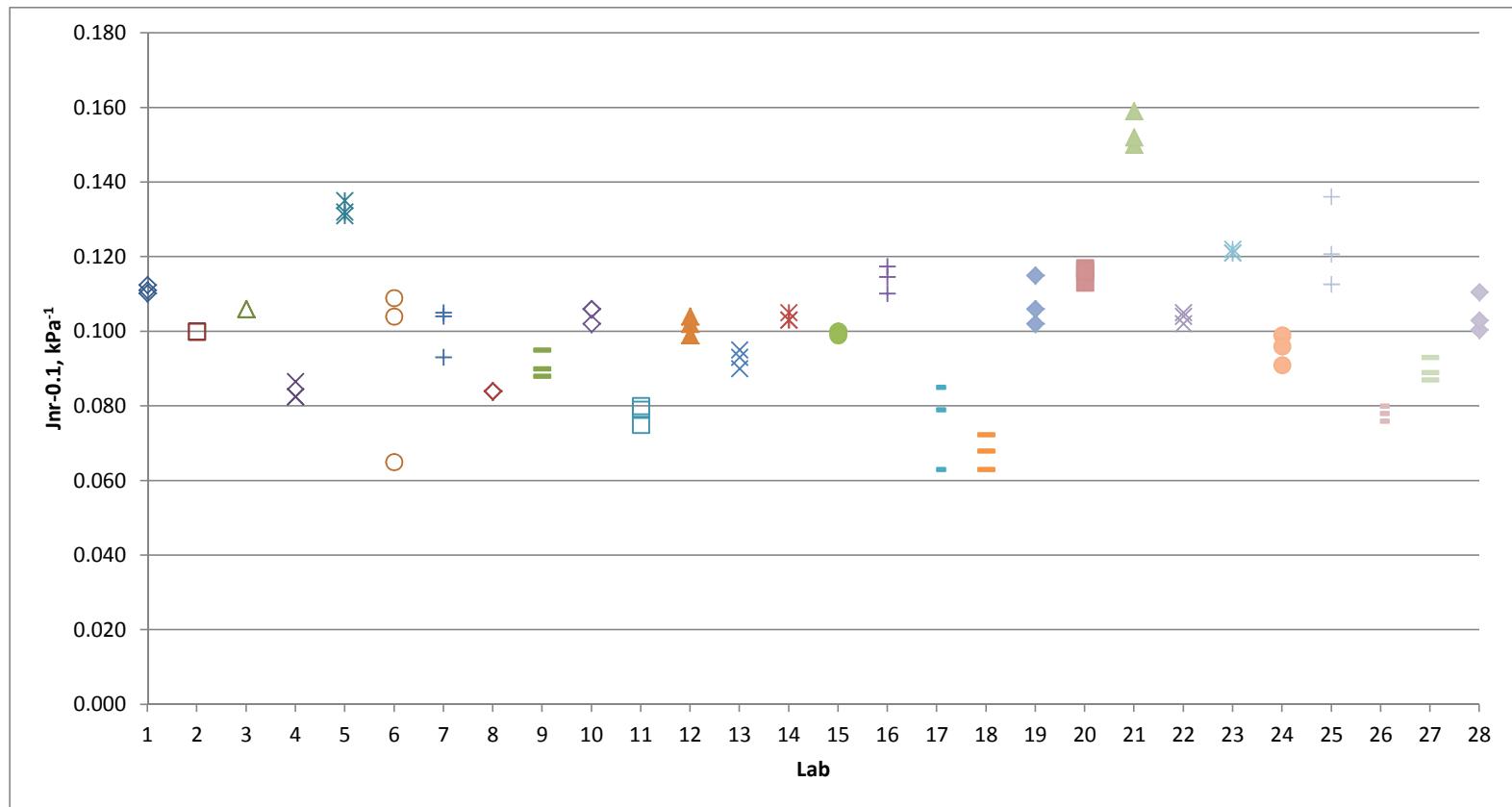
Binder D

PG 70-28 (58C)**Jnr (0.1 kPa)**

Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		0.110	0.111	0.112	0.11120	0.00111	0.01005	0.55	0.18
2		0.100	0.100	0.100	0.10000	0.00000	-0.00115	-0.06	0.00
3		0.106	0.106	0.106	0.10600	0.00000	0.00485	0.26	0.00
4		0.082	0.087	0.082	0.08382	0.00232	-0.01733	-0.95	0.37
5		0.131	0.135	0.132	0.13267	0.00208	0.03151	1.72	0.33
6		0.104	0.109	0.065	0.09267	0.02409	-0.00849	-0.46	3.82
7		0.105	0.104	0.093	0.10067	0.00666	-0.00049	-0.03	1.06
8		0.084	0.084	0.084	0.08400	0.00000	-0.01715	-0.94	0.00
9		0.088	0.090	0.095	0.09100	0.00361	-0.01015	-0.55	0.57
10		0.106	0.106	0.102	0.10467	0.00231	0.00351	0.19	0.37
11		0.075	0.079	0.080	0.07800	0.00265	-0.02315	-1.26	0.42
12		0.102	0.099	0.104	0.10167	0.00252	0.00051	0.03	0.40
13		0.093	0.090	0.095	0.09267	0.00252	-0.00849	-0.46	0.40
14		0.105	0.103	0.103	0.10367	0.00115	0.00251	0.14	0.18
15		0.100	0.100	0.099	0.09967	0.00058	-0.00149	-0.08	0.09
16		0.110	0.117	0.115	0.11403	0.00368	0.01288	0.70	0.58
17		0.085	0.063	0.079	0.07567	0.01137	-0.02549	-1.39	1.80
18		0.068	0.063	0.072	0.06777	0.00465	-0.03339	-1.82	0.74
19		0.106	0.102	0.115	0.10767	0.00666	0.00651	0.36	1.06
20		0.117	0.113	0.116	0.11540	0.00204	0.01425	0.78	0.32
21		0.150	0.152	0.159	0.15367	0.00473	0.05251	2.87	0.75
22		0.105	0.104	0.102	0.10367	0.00153	0.00251	0.14	0.24
23		0.122	0.121	0.121	0.12133	0.00058	0.02018	1.10	0.09
24		0.099	0.091	0.096	0.09533	0.00404	-0.00582	-0.32	0.64
25		0.121	0.113	0.136	0.12313	0.01194	0.02198	1.20	1.89
26		0.078	0.076	0.080	0.07800	0.00200	-0.02315	-1.26	0.32
27		0.087	0.093	0.089	0.08967	0.00306	-0.01149	-0.63	0.48
28		0.100	0.111	0.103	0.10461	0.00531	0.00346	0.19	0.84

Average of Cell Averages X-bar 0.101

Standard Deviation of Cell Averages S_{X-bar} 0.018Repeatability Standard Deviation S_r 0.00631 0.019Reproducibility Standard Deviation S_R 0.019



Binder D

PG 70-28 (58C)

Jnr (3.2 kPa)

Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		0.115	0.116	0.117	0.11580	0.00105	0.00903	0.46	0.22
2		0.100	0.100	0.100	0.10000	0.00000	-0.00677	-0.35	0.00
3		0.111	0.111	0.110	0.11067	0.00058	0.00389	0.20	0.12
4		0.085	0.087	0.083	0.08502	0.00241	-0.02175	-1.12	0.50
5		0.127	0.132	0.133	0.13067	0.00321	0.02389	1.23	0.66
6		0.106	0.114	0.124	0.11467	0.00902	0.00789	0.41	1.86
7		0.108	0.103	0.096	0.10233	0.00603	-0.00444	-0.23	1.24
8		0.084	0.084	0.087	0.08500	0.00173	-0.02177	-1.12	0.36
9		0.090	0.092	0.097	0.09300	0.00361	-0.01377	-0.71	0.74
10		0.111	0.110	0.105	0.10867	0.00321	0.00189	0.10	0.66
11		0.085	0.089	0.083	0.08567	0.00306	-0.02111	-1.08	0.63
12		0.106	0.103	0.108	0.10567	0.00252	-0.00111	-0.06	0.52
13		0.094	0.090	0.096	0.09333	0.00306	-0.01344	-0.69	0.63
14		0.108	0.108	0.108	0.10800	0.00000	0.00123	0.06	0.00
15		0.118	0.116	0.115	0.11633	0.00153	0.00956	0.49	0.31
16		0.116	0.122	0.121	0.11947	0.00347	0.01269	0.65	0.71
17		0.093	0.066	0.088	0.08233	0.01436	-0.02444	-1.26	2.96
18		0.074	0.063	0.073	0.07007	0.00605	-0.03671	-1.89	1.24
19		0.111	0.106	0.120	0.11233	0.00709	0.00556	0.29	1.46
20		0.128	0.118	0.121	0.12247	0.00515	0.01569	0.81	1.06
21		0.163	0.164	0.174	0.16700	0.00608	0.06023	3.10	1.25
22		0.109	0.107	0.104	0.10667	0.00252	-0.00011	-0.01	0.52
23		0.130	0.126	0.131	0.12900	0.00265	0.02223	1.14	0.54
24		0.102	0.095	0.098	0.09833	0.00351	-0.00844	-0.43	0.72
25		0.133	0.125	0.138	0.13203	0.00634	0.02526	1.30	1.31
26		0.089	0.092	0.087	0.08933	0.00252	-0.01744	-0.90	0.52
27		0.099	0.101	0.100	0.10000	0.00100	-0.00677	-0.35	0.21
28		0.101	0.112	0.105	0.10584	0.00552	-0.00093	-0.05	1.14

Average of Cell Averages

X-bar 0.107

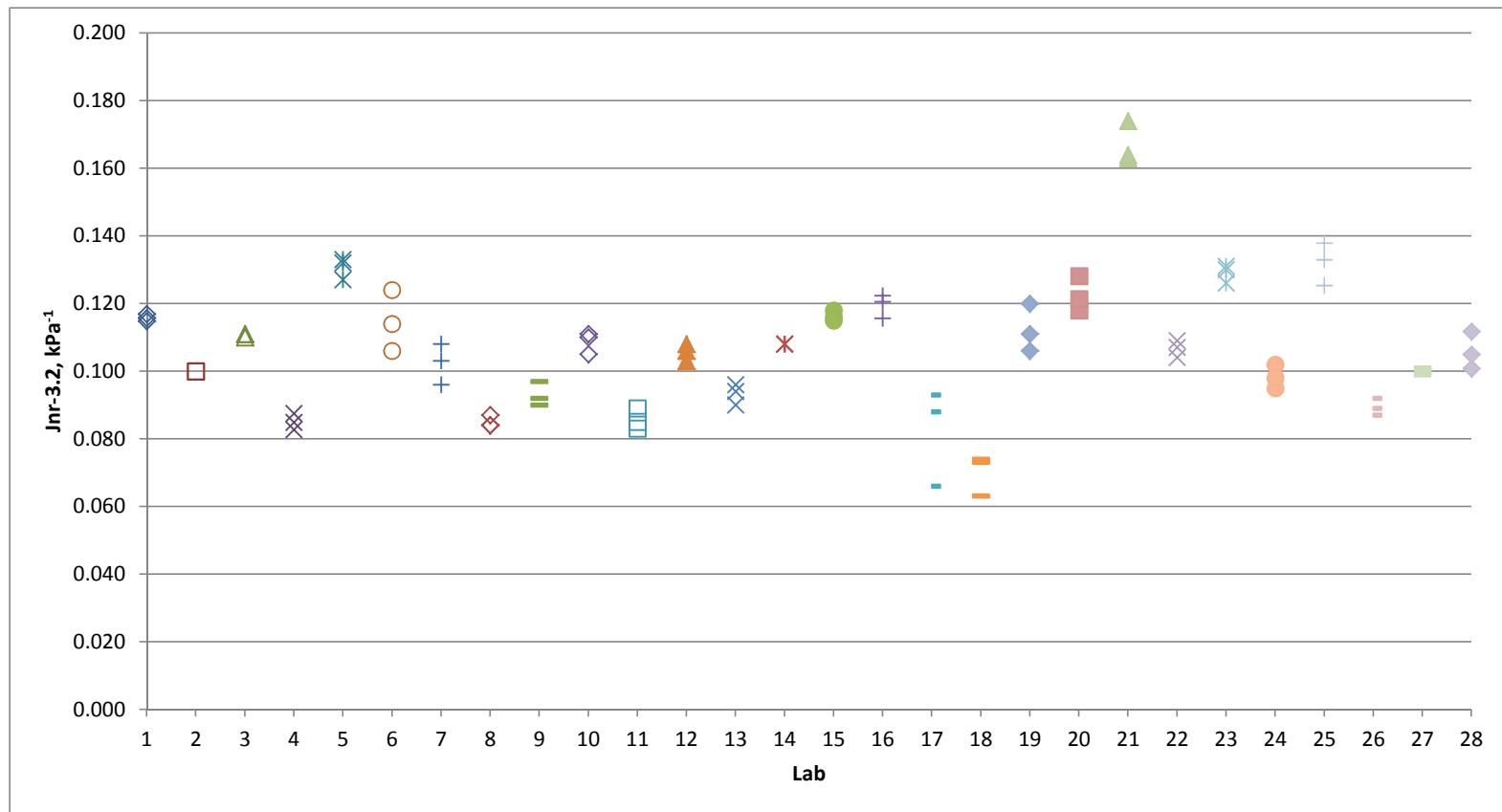
Standard Deviation of Cell Averages

$S_{X\text{-bar}}$ 0.019

Repeatability Standard Deviation

s_r 0.00486 0.020

Reproducibility Standard Deviation



Binder D

PG 70-28 (58C)

Recovery (0.1 kPa)

Lab No.	Lab Name	Results, x								
		1	2	3	Average	s	d	h	k	
1		74.0	74.0	74.5	74.147	0.282	-0.425	-0.17	0.50	
2		75.0	75.0	75.0	75.000	0.000	0.428	0.17	0.00	
3		74.5	74.5	74.7	74.567	0.115	-0.005	0.00	0.21	
4		75.8	75.6	75.5	75.617	0.166	1.045	0.41	0.30	
5		66.0	67.0	68.0	67.000	1.000	-7.572	-3.01	1.79	
6		72.4	73.0	72.1	72.500	0.458	-2.072	-0.82	0.82	
7		75.7	74.7	74.8	75.067	0.551	0.495	0.20	0.98	
8		75.9	76.2	76.5	76.200	0.300	1.628	0.65	0.54	
9		76.5	75.9	76.2	76.200	0.300	1.628	0.65	0.54	
10		74.1	74.1	74.3	74.167	0.115	-0.405	-0.16	0.21	
11		78.9	78.5	77.6	78.333	0.666	3.762	1.49	1.19	
12		74.7	74.8	74.4	74.633	0.208	0.062	0.02	0.37	
13		75.6	76.3	75.7	75.867	0.379	1.295	0.51	0.68	
14		73.5	73.5	73.4	73.467	0.058	-1.105	-0.44	0.10	
15		74.2	73.8	74.1	74.030	0.174	-0.542	-0.22	0.31	
16		73.5	75.2	73.7	74.133	0.939	-0.438	-0.17	1.68	
17										
18		78.4	77.8	76.7	77.633	0.862	3.062	1.22	1.54	
19		73.9	74.1	74.0	74.000	0.100	-0.572	-0.23	0.18	
20		74.1	74.8	74.0	74.280	0.479	-0.292	-0.12	0.86	
21		69.4	69.2	68.6	69.067	0.416	-5.505	-2.19	0.74	
22		74.7	74.9	75.5	75.033	0.416	0.462	0.18	0.74	
23		72.3	72.2	72.5	72.300	0.135	-2.272	-0.90	0.24	
24		75.1	76.5	75.6	75.733	0.709	1.162	0.46	1.27	
25		74.1	75.4	72.0	73.813	1.733	-0.758	-0.30	3.09	
26		78.8	78.9	78.4	78.700	0.265	4.128	1.64	0.47	
27		78.5	77.8	78.4	78.233	0.379	3.662	1.45	0.68	
28		73.6	73.6	73.9	73.714	0.170	-0.857	-0.34	0.30	

Average of Cell Averages

X-bar 74.572

Standard Deviation of Cell Averages

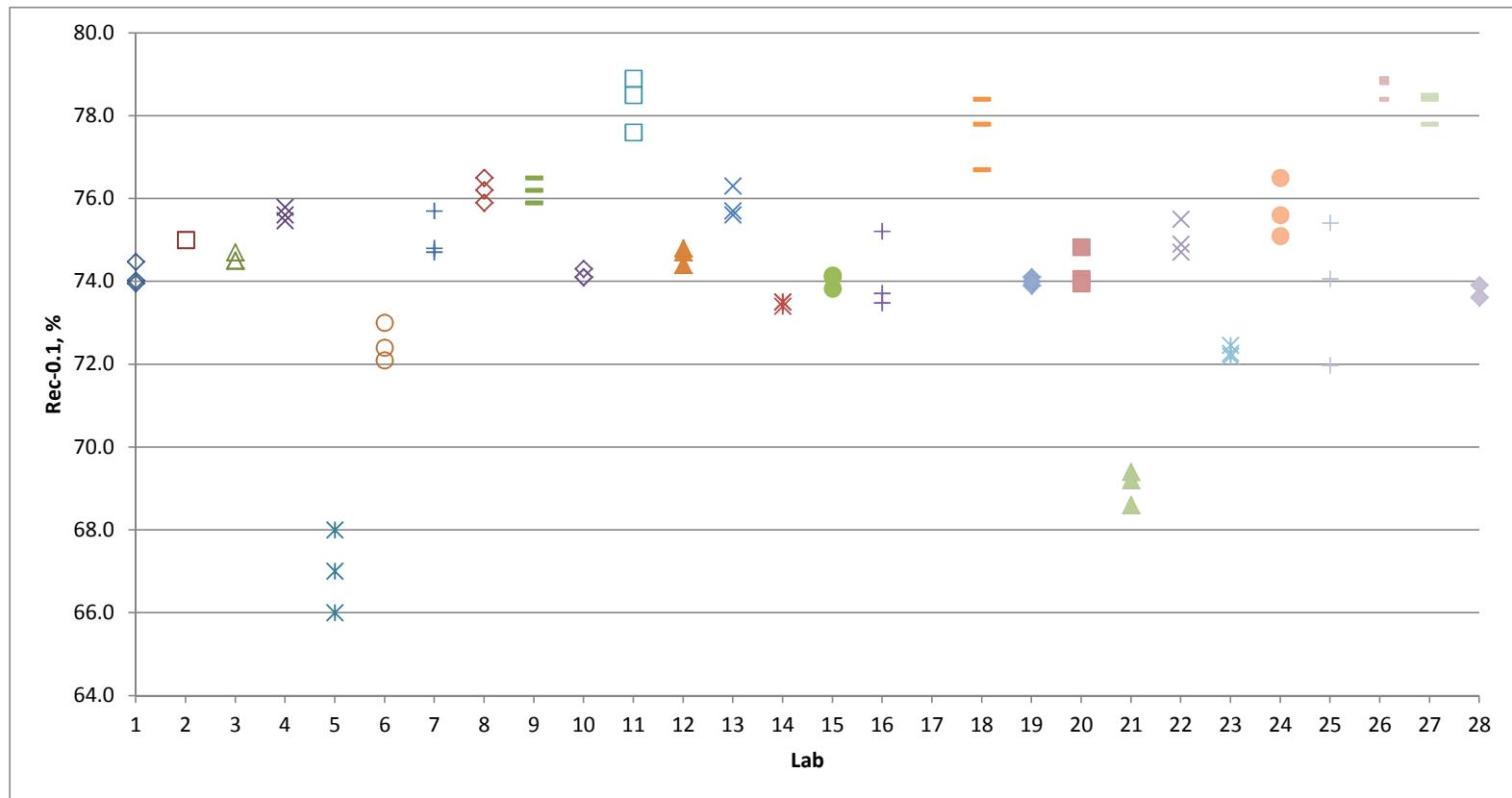
s_{X-bar} 2.518

Repeatability Standard Deviation

s_r 0.56013 2.560

Reproducibility Standard Deviation

s_R 2.560



Binder D

PG 70-28 (58C)**Recovery (3.2 kPa)**

Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		72.7	72.3	73.2	72.72333	0.48222	-0.55391	-0.22	1.05
2		75.0	75.0	75.0	75.00000	0.00000	1.72276	0.68	0.00
3		73.3	73.4	73.8	73.50000	0.26458	0.22276	0.09	0.58
4		75.0	75.2	75.0	75.03667	0.10786	1.75942	0.69	0.24
5		67.2	67.1	67.2	67.16667	0.05774	-6.11058	-2.41	0.13
6		72.2	71.3	70.3	71.26667	0.95044	-2.01058	-0.79	2.07
7		74.8	74.7	73.7	74.40000	0.60828	1.12276	0.44	1.33
8		75.8	76.0	75.7	75.83333	0.15275	2.55609	1.01	0.33
9		75.7	75.2	75.5	75.46667	0.25166	2.18942	0.86	0.55
10		72.8	72.8	73.2	72.93333	0.23094	-0.34391	-0.14	0.50
11		76.4	75.8	76.6	76.26667	0.41633	2.98942	1.18	0.91
12		73.7	73.7	73.2	73.53333	0.28868	0.25609	0.10	0.63
13		75.1	75.9	75.1	75.36667	0.46188	2.08942	0.82	1.01
14		72.2	72.3	72.5	72.33333	0.15275	-0.94391	-0.37	0.33
15		71.0	70.9	71.2	71.01333	0.14742	-2.26391	-0.89	0.32
16		72.4	72.0	72.1	72.17000	0.19975	-1.10724	-0.44	0.44
17									
18		76.3	77.6	76.2	76.70000	0.78102	3.42276	1.35	1.70
19		72.6	73.1	72.7	72.80000	0.26458	-0.47724	-0.19	0.58
20		71.5	73.6	72.6	72.55667	1.03568	-0.72058	-0.28	2.26
21		66.7	66.6	65.6	66.30000	0.60828	-6.97724	-2.75	1.33
22		73.6	73.9	74.4	73.96667	0.40415	0.68942	0.27	0.88
23		70.7	70.9	70.4	70.65333	0.21502	-2.62391	-1.03	0.47
24		74.3	75.4	74.8	74.83333	0.55076	1.55609	0.61	1.20
25		71.4	72.4	71.4	71.73000	0.60622	-1.54724	-0.61	1.32
26		76.0	75.2	76.4	75.86667	0.61101	2.58942	1.02	1.33
27		75.7	75.9	75.7	75.76667	0.11547	2.48942	0.98	0.25
28		73.4	73.2	73.3	73.30223	0.08071	0.02498	0.01	0.18

Average of Cell Averages

X-bar 73.277

Standard Deviation of Cell Averages

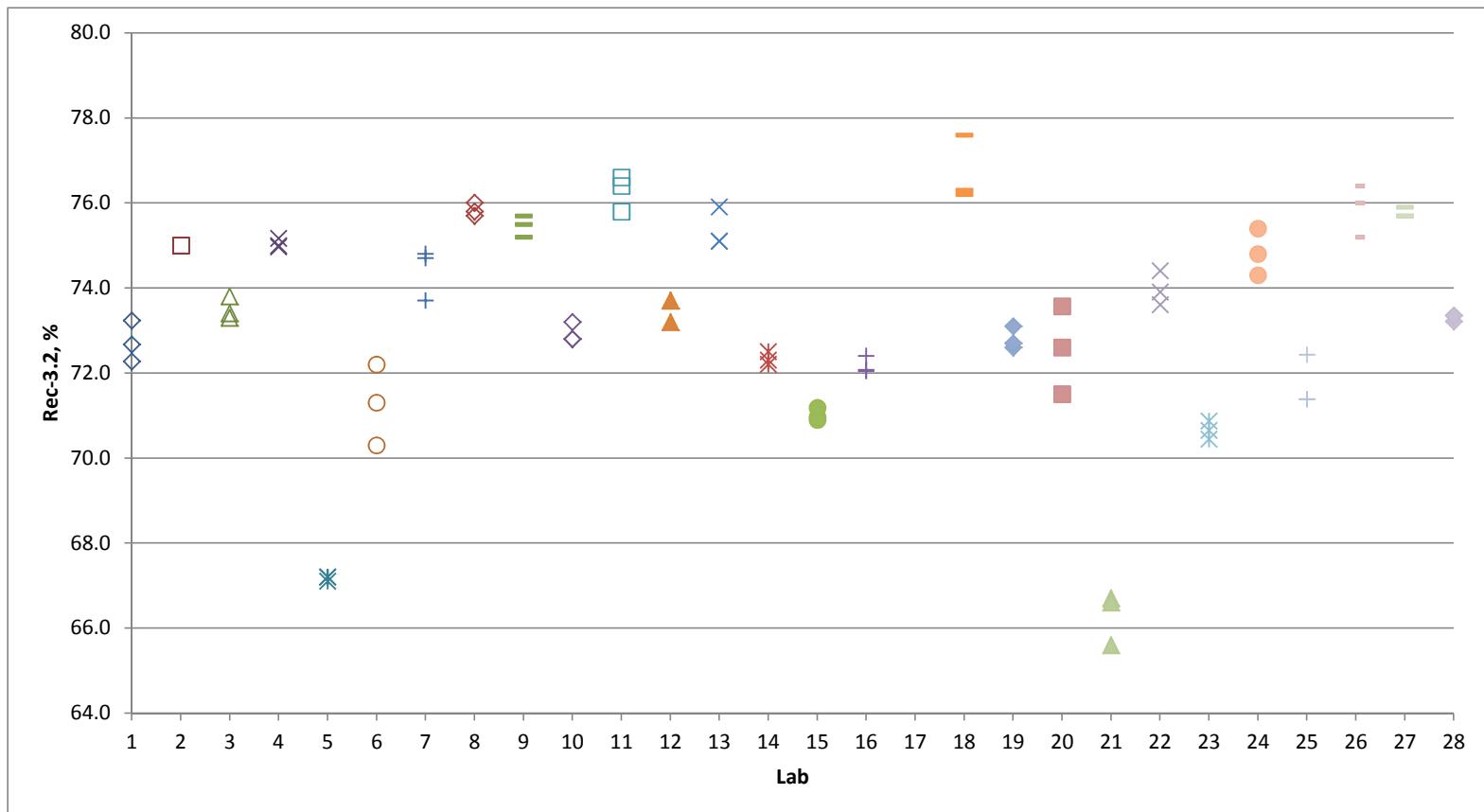
S_{X-bar} 2.537

Repeatability Standard Deviation

S_r 0.45874 2.564

Reproducibility Standard Deviation

S_R 2.564



Binder D

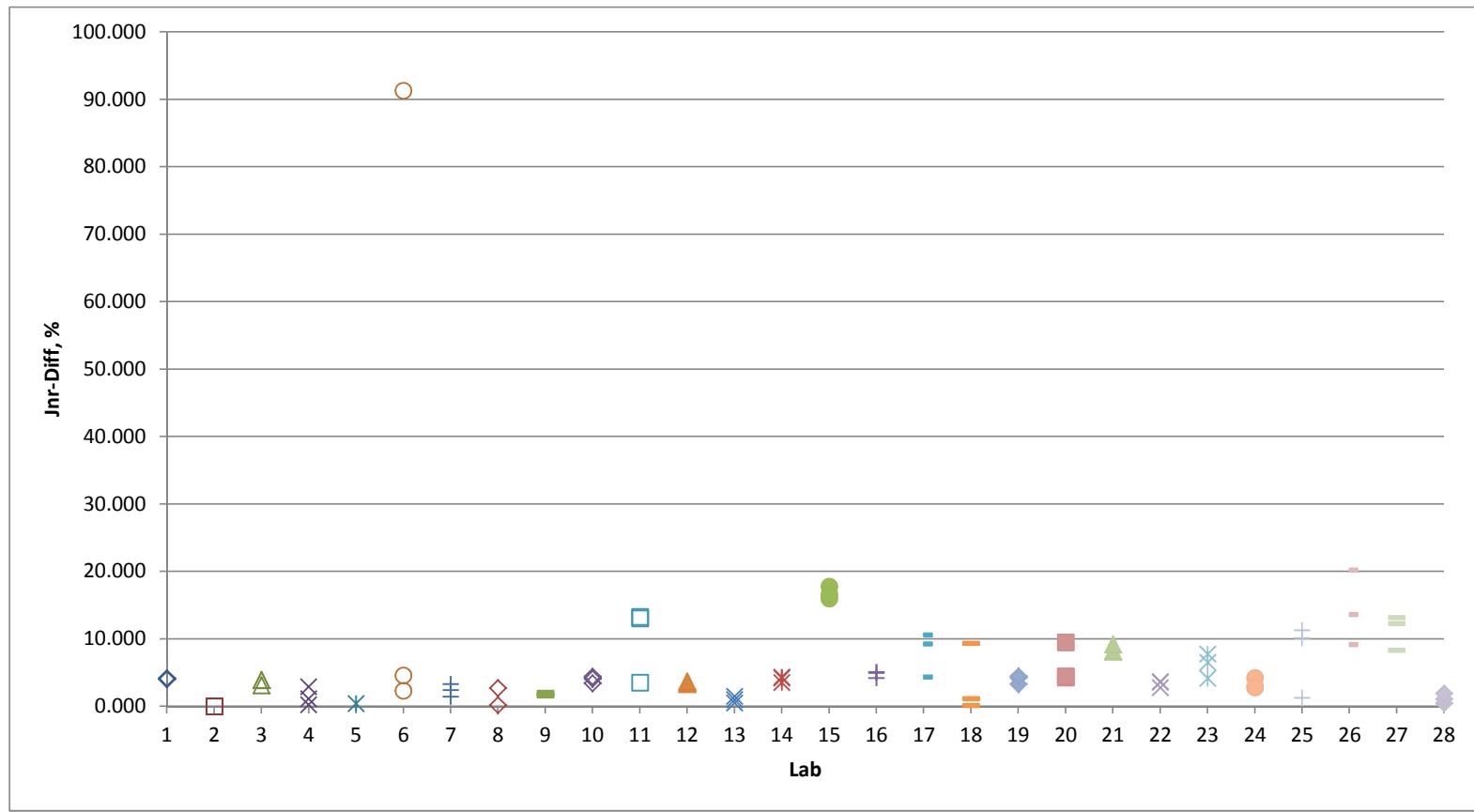
PG 70-28 (58C)

Jnr-Diff

Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		4.130	4.200	4.030	4.12000	0.08544	-1.93662	-0.29	0.01
2		0.000	0.000	0.000	0.00000	0.00000	-6.05662	-0.91	0.00
3		3.926	3.910	3.144	3.66000	0.44694	-2.39662	-0.36	0.04
4		2.921	1.143	0.235	1.43293	1.36637	-4.62368	-0.70	0.14
5			0.420	0.42000			-5.63662	-0.85	0.00
6		2.319	4.586	91.300	32.73500	50.73144	26.67838	4.01	5.04
7		2.403	1.428	3.326	2.38567	0.94912	-3.67095	-0.55	0.09
8			0.176	2.727	1.45150	1.80383	-4.60512	-0.69	0.18
9		2.111	1.810	1.560	1.82700	0.27589	-4.22962	-0.64	0.03
10		4.117	4.411	3.434	3.98733	0.50124	-2.06928	-0.31	0.05
11		13.075	13.286	3.529	9.96333	5.57329	3.90672	0.59	0.55
12		3.297	3.559	3.727	3.52767	0.21671	-2.52895	-0.38	0.02
13		1.007	0.525	1.491	1.00767	0.48300	-5.04895	-0.76	0.05
14		3.520	4.344	4.218	4.02733	0.44386	-2.02928	-0.31	0.04
15		17.800	16.000	16.620	16.80667	0.91440	10.75005	1.62	0.09
16		4.980	4.223	5.107	4.77000	0.47795	-1.28662	-0.19	0.05
17		9.300	4.400	10.600	8.10000	3.26956	2.04338	0.31	0.33
18		9.386	0.141	1.158	3.56167	5.06959	-2.49495	-0.38	0.50
19		4.253	3.312	4.469	4.01133	0.61519	-2.04528	-0.31	0.06
20		9.491	4.276	4.482	6.08300	2.95321	0.02638	0.00	0.29
21		8.100	8.200	9.200	8.50000	0.60828	2.44338	0.37	0.06
22		3.681	3.582	2.788	3.35033	0.48950	-2.70628	-0.41	0.05
23		6.521	4.176	7.779	6.15867	1.82862	0.10205	0.02	0.18
24		2.874	4.235	2.825	3.31133	0.80029	-2.74528	-0.41	0.08
25		10.140	11.290	1.283	7.57100	5.47584	1.51438	0.23	0.54
26		13.631	20.241	9.195	14.35567	5.55854	8.29905	1.25	0.55
27		13.200	8.360	12.300	11.28667	2.57421	5.23005	0.79	0.26
28		0.482	1.086	1.952	1.17351	0.73909	-4.88310	-0.73	0.07

Average of Cell Averages
 Standard Deviation of Cell Averages
 Repeatability Standard Deviation
 Reproducibility Standard Deviation

X-bar	6.057
S _{X-bar}	6.651
S _r	10.05720
S _R	10.567

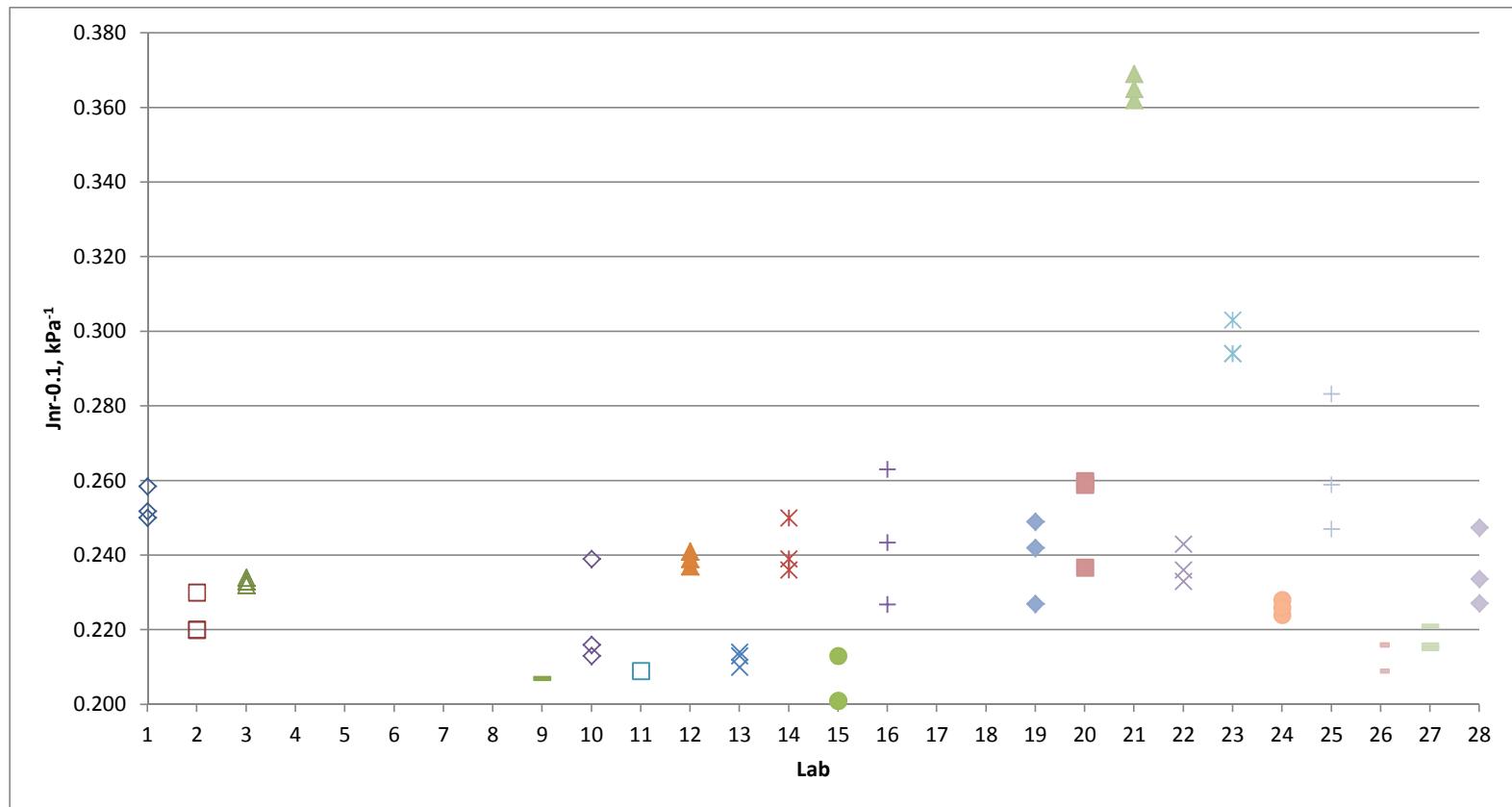


Binder D64
PG 70-28 (64C)

Jnr (0.1 kPa)

Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		0.250	0.259	0.252	0.25347	0.00444	0.01974	0.50	0.52
2		0.230	0.220	0.220	0.22333	0.00577	-0.01039	-0.26	0.67
3		0.234	0.232	0.233	0.23300	0.00100	-0.00072	-0.02	0.12
4		0.188	0.194	0.191	0.19120	0.00295	-0.04252	-1.08	0.34
5									
6									
7									
8									
9		0.198	0.207	0.196	0.20033	0.00586	-0.03339	-0.84	0.68
10		0.239	0.213	0.216	0.22267	0.01422	-0.01106	-0.28	1.66
11		0.192	0.191	0.209	0.19733	0.01012	-0.03639	-0.92	1.18
12		0.241	0.237	0.239	0.23900	0.00200	0.00528	0.13	0.23
13		0.210	0.214	0.213	0.21233	0.00208	-0.02139	-0.54	0.24
14		0.236	0.250	0.239	0.24167	0.00737	0.00794	0.20	0.86
15		0.201	0.213	0.201	0.20500	0.00693	-0.02872	-0.73	0.81
16		0.243	0.227	0.263	0.24440	0.01812	0.01068	0.27	2.11
17									
18		0.163	0.164	0.168	0.16500	0.00265	-0.06872	-1.74	0.31
19		0.227	0.249	0.242	0.23933	0.01124	0.00561	0.14	1.31
20		0.260	0.237	0.259	0.25183	0.01312	0.01811	0.46	1.53
21		0.369	0.362	0.365	0.36533	0.00351	0.13161	3.33	0.41
22		0.233	0.243	0.236	0.23733	0.00513	0.00361	0.09	0.60
23		0.303	0.294	0.294	0.29700	0.00520	0.06328	1.60	0.61
24		0.224	0.228	0.226	0.22600	0.00200	-0.00772	-0.20	0.23
25		0.283	0.247	0.259	0.26303	0.01845	0.02931	0.74	2.15
26		0.216	0.216	0.209	0.21367	0.00404	-0.02006	-0.51	0.47
27		0.221	0.216	0.215	0.21733	0.00321	-0.01639	-0.41	0.37
28		0.247	0.227	0.234	0.23607	0.01036	0.00235	0.06	1.21

Average of Cell Averages
Standard Deviation of Cell Averages
Repeatability Standard Deviation
Reproducibility Standard Deviation

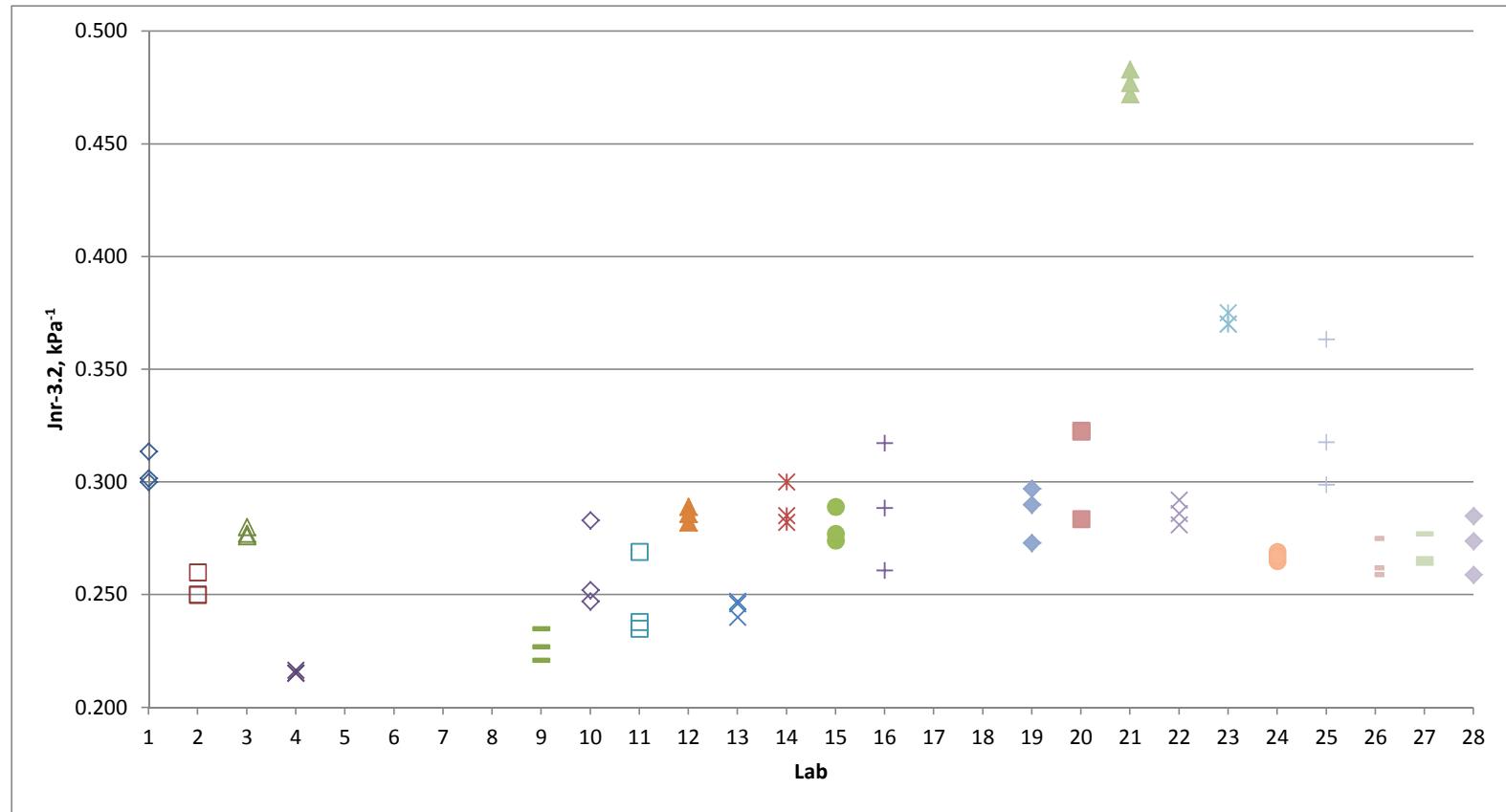


Binder D64
PG 70-28 (64C)

Jnr (3.2 kPa)

Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		0.300	0.314	0.302	0.30503	0.00738	0.02251	0.40	0.56
2		0.260	0.250	0.250	0.25333	0.00577	-0.02919	-0.52	0.44
3		0.280	0.276	0.277	0.27767	0.00208	-0.00486	-0.09	0.16
4		0.215	0.215	0.217	0.21567	0.00072	-0.06686	-1.19	0.05
5									
6									
7									
8									
9		0.227	0.235	0.221	0.22767	0.00702	-0.05486	-0.97	0.53
10		0.283	0.247	0.252	0.26067	0.01950	-0.02186	-0.39	1.48
11		0.235	0.238	0.269	0.24733	0.01882	-0.03519	-0.62	1.43
12		0.289	0.282	0.286	0.28563	0.00351	0.00311	0.06	0.27
13		0.240	0.246	0.247	0.24433	0.00379	-0.03819	-0.68	0.29
14		0.282	0.300	0.285	0.28900	0.00964	0.00647	0.11	0.73
15		0.274	0.289	0.277	0.28000	0.00794	-0.00253	-0.04	0.60
16		0.289	0.261	0.317	0.28883	0.02820	0.00631	0.11	2.14
17									
18		0.192	0.189	0.192	0.19100	0.00173	-0.09153	-1.62	0.13
19		0.273	0.297	0.290	0.28667	0.01234	0.00414	0.07	0.94
20		0.323	0.284	0.322	0.30957	0.02258	0.02704	0.48	1.71
21		0.483	0.472	0.477	0.47733	0.00551	0.19481	3.46	0.42
22		0.281	0.292	0.286	0.28633	0.00551	0.00381	0.07	0.42
23		0.375	0.370	0.370	0.37167	0.00289	0.08914	1.58	0.22
24		0.265	0.269	0.267	0.26700	0.00200	-0.01553	-0.28	0.15
25		0.363	0.299	0.318	0.32657	0.03320	0.04404	0.78	2.52
26		0.275	0.259	0.262	0.26533	0.00850	-0.01719	-0.30	0.65
27		0.277	0.264	0.266	0.26900	0.00700	-0.01353	-0.24	0.53
28		0.285	0.259	0.274	0.27251	0.01314	-0.01002	-0.18	1.00

Average of Cell Averages
Standard Deviation of Cell Averages
Repeatability Standard Deviation
Reproducibility Standard Deviation



Binder D64
PG 70-28 (64C)

Recovery (0.1 kPa)

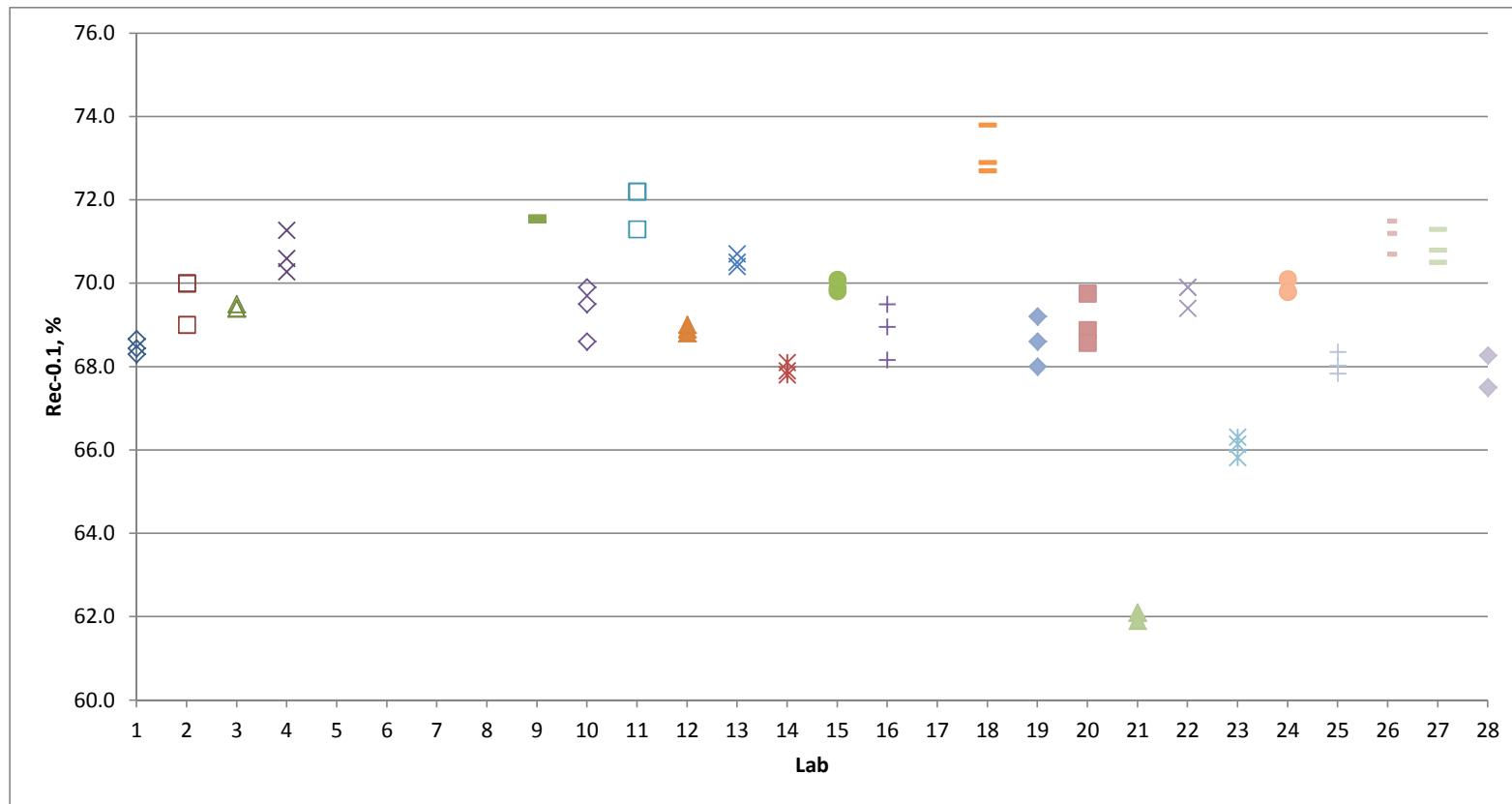
Lab No.	Lab Name	Results, x					s	d	h	k
		1	2	3	Average					
1		68.7	68.3	68.4	68.467	0.181	-0.820	-0.37	0.45	
2		69.0	70.0	70.0	69.667	0.577	0.380	0.17	1.43	
3		69.4	69.4	69.5	69.433	0.058	0.147	0.07	0.14	
4		71.3	70.3	70.6	70.710	0.511	1.424	0.64	1.27	
5										
6										
7										
8										
9		71.5	71.6	71.5	71.533	0.058	2.247	1.02	0.14	
10		68.6	69.5	69.9	69.333	0.666	0.047	0.02	1.65	
11		72.2	72.2	71.3	71.900	0.520	2.614	1.18	1.29	
12		68.9	68.8	69.0	68.900	0.100	-0.386	-0.17	0.25	
13		70.7	70.5	70.4	70.533	0.153	1.247	0.56	0.38	
14		68.1	67.8	67.9	67.933	0.153	-1.353	-0.61	0.38	
15		69.8	69.9	70.1	69.930	0.144	0.644	0.29	0.36	
16		69.0	69.5	68.2	68.867	0.669	-0.420	-0.19	1.66	
17										
18		73.8	72.9	72.7	73.133	0.586	3.847	1.74	1.45	
19		69.2	68.0	68.6	68.600	0.600	-0.686	-0.31	1.49	
20		68.9	69.8	68.6	69.067	0.612	-0.220	-0.10	1.52	
21		62.1	62.1	61.9	62.033	0.115	-7.253	-3.28	0.29	
22		69.9	69.4	69.9	69.733	0.289	0.447	0.20	0.72	
23		65.8	66.1	66.3	66.090	0.249	-3.196	-1.45	0.62	
24		70.1	69.8	69.8	69.900	0.173	0.614	0.28	0.43	
25		68.0	68.4	67.8	68.067	0.263	-1.220	-0.55	0.65	
26		71.2	70.7	71.5	71.133	0.404	1.847	0.84	1.00	
27		70.8	70.5	71.3	70.867	0.404	1.580	0.72	1.00	
28		67.5	67.5	68.3	67.755	0.445	-1.531	-0.69	1.11	

Average of Cell Averages X-bar 69.286

Standard Deviation of Cell Averages S_{X-bar} 2.209

Repeatability Standard Deviation S_r 0.40283 2.233

Reproducibility Standard Deviation S_R 2.233



Binder D64

PG 70-28 (64C)

Recovery (3.2 kPa)

Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		62.4	61.6	62.2	62.06667	0.40501	-1.03714	-0.30	0.62
2		65.0	65.0	66.0	65.33333	0.57735	2.22953	0.64	0.89
3		63.6	63.7	63.8	63.70000	0.10000	0.59619	0.17	0.15
4		67.0	66.4	66.4	66.56000	0.33779	3.45619	0.99	0.52
5									
6									
7									
8									
9		67.0	67.5	67.5	67.33333	0.28868	4.22953	1.21	0.44
10		62.8	64.6	64.9	64.10000	1.13578	0.99619	0.29	1.75
11		66.2	65.6	64.0	65.26667	1.13725	2.16286	0.62	1.75
12		62.8	62.8	62.9	62.83333	0.05774	-0.27047	-0.08	0.09
13		66.3	65.9	65.7	65.96667	0.30551	2.86286	0.82	0.47
14		62.0	61.5	61.8	61.76667	0.25166	-1.33714	-0.38	0.39
15		60.9	60.6	60.9	60.77333	0.18475	-2.33047	-0.67	0.28
16		62.8	63.9	61.7	62.82667	1.10024	-0.27714	-0.08	1.69
17									
18		68.9	68.7	68.4	68.66667	0.25166	5.56286	1.59	0.39
19		63.3	61.8	62.4	62.50000	0.75498	-0.60381	-0.17	1.16
20		61.5	63.8	61.1	62.12667	1.42858	-0.97714	-0.28	2.20
21		51.1	51.5	51.1	51.23333	0.23094	-11.87047	-3.40	0.36
22		64.1	63.3	64.1	63.83333	0.46188	0.72953	0.21	0.71
23		57.8	58.0	58.1	57.97667	0.15695	-5.12714	-1.47	0.24
24		65.0	64.4	64.5	64.63333	0.32146	1.52953	0.44	0.50
25		59.4	61.8	60.7	60.64000	1.20578	-2.46381	-0.71	1.86
26		63.8	64.6	64.7	64.38000	0.47032	1.27619	0.37	0.72
27		63.5	64.0	64.4	63.96667	0.45092	0.86286	0.25	0.69
28		62.6	63.1	63.0	62.90422	0.23488	-0.19959	-0.06	0.36

Average of Cell Averages

X-bar 63.104

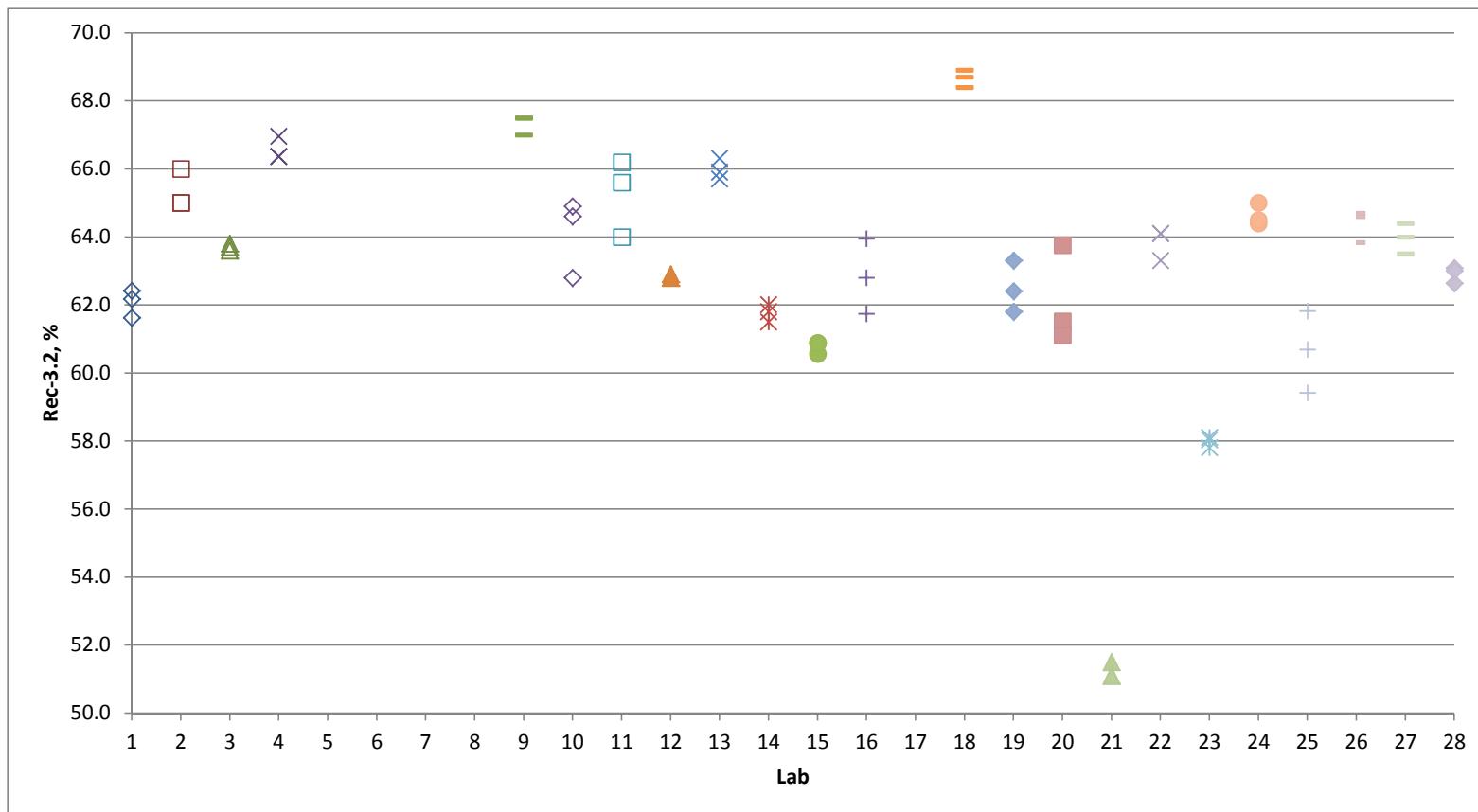
Standard Deviation of Cell Averages

$s_{X\text{-har}}$ 3.492

Repeatability Standard Deviation

s_r 0.64925 3.532

Reproducibility Standard Deviation



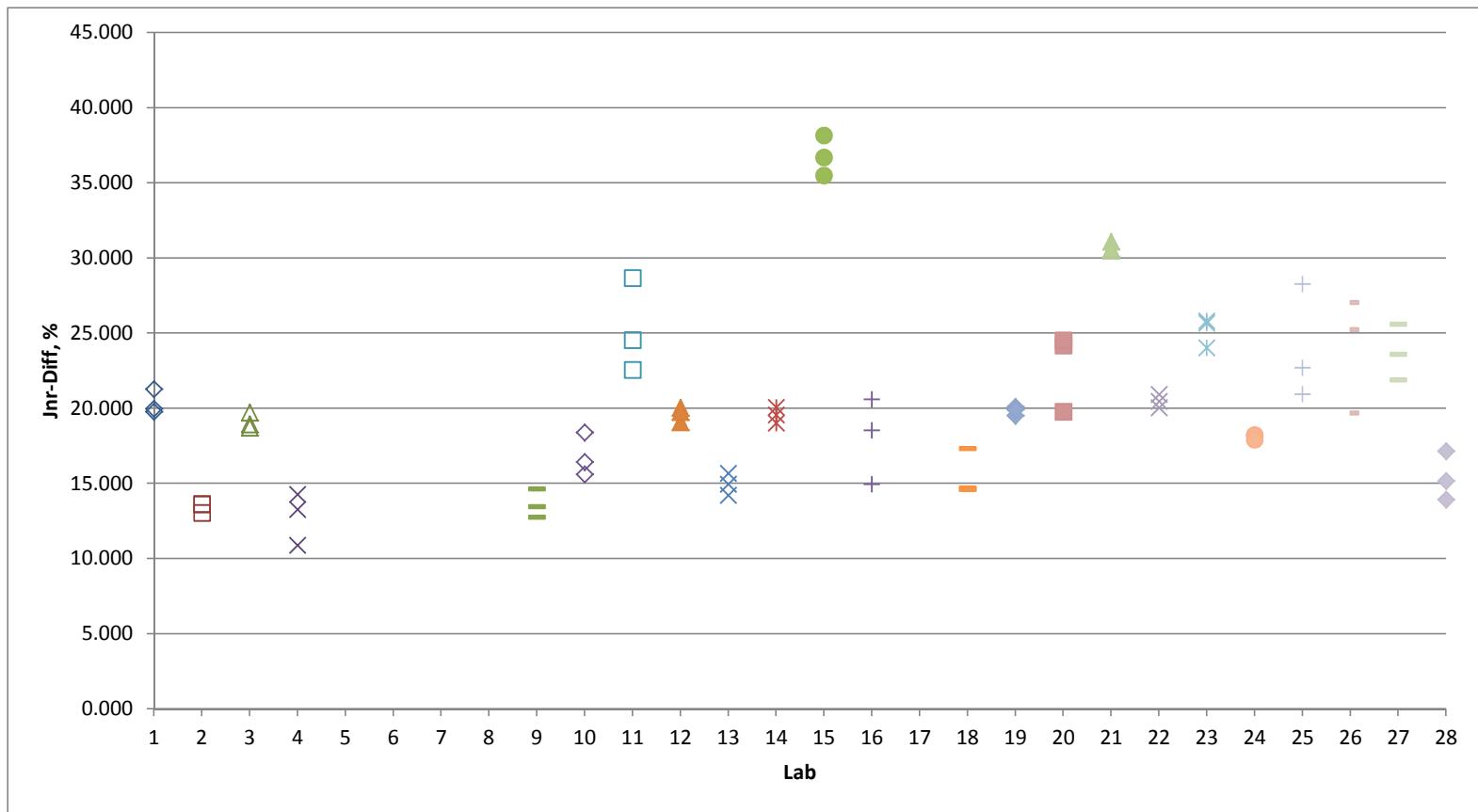
Binder D64
PG 70-28 (64C)

Jnr-Diff

Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		19.980	21.280	19.780	20.34667	0.81445	-0.09413	-0.02	0.45
2		13.043	13.636	13.636	13.43874	0.34230	-7.00206	-1.22	0.19
3		19.716	18.706	18.934	19.11867	0.52972	-1.32213	-0.23	0.30
4		14.270	10.880	13.260	12.80333	1.74053	-7.63747	-1.33	0.97
5									
6									
7									
8									
9		14.650	13.460	12.770	13.62667	0.95102	-6.81413	-1.19	0.53
10		18.388	15.613	16.434	16.81167	1.42553	-3.62913	-0.63	0.79
11		22.560	24.537	28.679	25.25867	3.12268	4.81787	0.84	1.74
12		20.045	19.078	19.764	19.62900	0.49743	-0.81180	-0.14	0.28
13		14.209	14.943	15.666	14.93933	0.72851	-5.50147	-0.96	0.41
14		19.557	20.058	19.013	19.54267	0.52265	-0.89813	-0.16	0.29
15		36.700	35.510	38.170	36.79333	1.33245	16.35253	2.86	0.74
16		18.526	14.948	20.595	18.02300	2.85691	-2.41780	-0.42	1.59
17									
18		17.331	14.700	14.617	15.54933	1.54353	-4.89147	-0.85	0.86
19		20.093	19.520	19.919	19.84400	0.29377	-0.59680	-0.10	0.16
20		24.190	19.780	24.530	22.83333	2.64972	2.39253	0.42	1.48
21		31.100	30.500	30.600	30.73333	0.32146	10.29253	1.80	0.18
22		20.451	20.041	20.923	20.47167	0.44136	0.03087	0.01	0.25
23		24.033	25.670	25.813	25.17200	0.98899	4.73120	0.83	0.55
24		18.230	18.200	17.920	18.11667	0.17098	-2.32413	-0.41	0.10
25		28.270	20.940	22.700	23.97000	3.82647	3.52920	0.62	2.13
26		27.049	19.691	25.236	23.99200	3.83350	3.55120	0.62	2.14
27		25.600	21.900	23.600	23.70000	1.85203	3.25920	0.57	1.03
28		15.176	13.936	17.161	15.42432	1.62657	-5.01648	-0.88	0.91

Average of Cell Averages
Standard Deviation of Cell Averages
Repeatability Standard Deviation
Reproducibility Standard Deviation

X-bar	20.441
s _{X-bar}	5.727
s _r	1.79341
s _R	5.911



Binder E

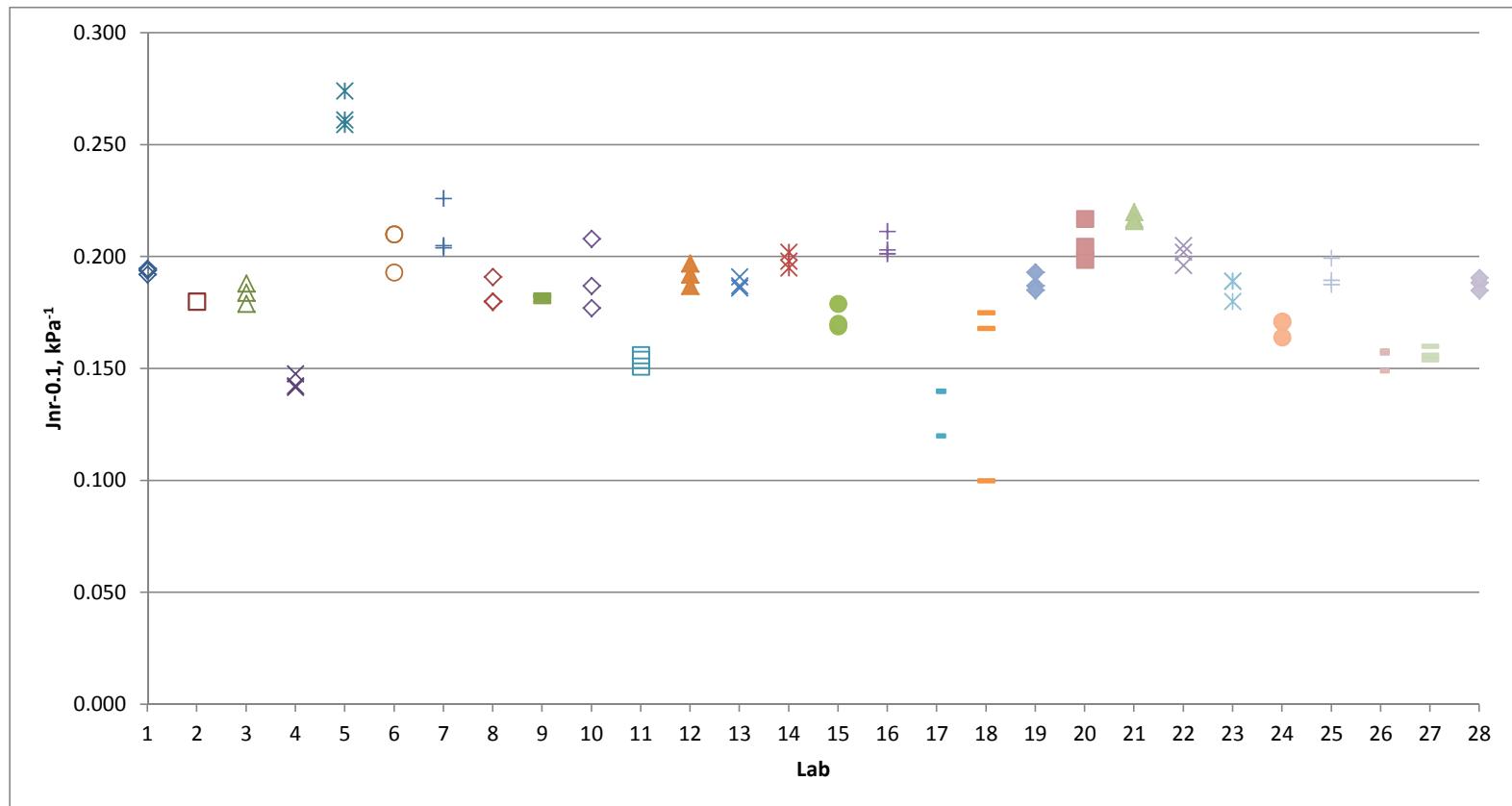
PG 76-22

Jnr (0.1 kPa)

Lab No.	Lab Name	Results, x					h	k	
		1	2	3	Average	s			
1		0.194	0.195	0.192	0.19353	0.00132	0.00823	0.31	0.13
2		0.180	0.180	0.180	0.18000	0.00000	-0.00530	-0.20	0.00
3		0.188	0.184	0.179	0.18367	0.00451	-0.00163	-0.06	0.45
4		0.142	0.148	0.142	0.14383	0.00328	-0.04147	-1.56	0.32
5		0.274	0.259	0.261	0.26467	0.00814	0.07937	2.99	0.81
6		0.210	0.210	0.193	0.20433	0.00981	0.01903	0.72	0.97
7		0.205	0.204	0.226	0.21167	0.01242	0.02637	0.99	1.23
8		0.191	0.180	0.180	0.18367	0.00635	-0.00163	-0.06	0.63
9		0.180	0.183	0.182	0.18167	0.00153	-0.00363	-0.14	0.15
10		0.208	0.187	0.177	0.19067	0.01582	0.00537	0.20	1.57
11		0.154	0.156	0.151	0.15367	0.00252	-0.03163	-1.19	0.25
12		0.192	0.187	0.197	0.19200	0.00500	0.00670	0.25	0.50
13		0.187	0.186	0.191	0.18800	0.00265	0.00270	0.10	0.26
14		0.198	0.195	0.202	0.19833	0.00351	0.01303	0.49	0.35
15		0.179	0.169	0.170	0.17267	0.00551	-0.01263	-0.48	0.55
16		0.211	0.203	0.201	0.20520	0.00535	0.01990	0.75	0.53
17		0.140	0.120	0.140	0.13333	0.01155	-0.05197	-1.96	1.14
18		0.100	0.168	0.175	0.14767	0.04143	-0.03763	-1.42	4.10
19		0.187	0.193	0.185	0.18833	0.00416	0.00303	0.11	0.41
20		0.199	0.217	0.205	0.20673	0.00929	0.02143	0.81	0.92
21		0.217	0.220	0.216	0.21767	0.00208	0.03237	1.22	0.21
22		0.196	0.202	0.205	0.20100	0.00458	0.01570	0.59	0.45
23		0.180	0.189	0.189	0.18600	0.00520	0.00070	0.03	0.51
24		0.171	0.171	0.164	0.16867	0.00404	-0.01663	-0.63	0.40
25		0.190	0.188	0.199	0.19213	0.00637	0.00683	0.26	0.63
26		0.149	0.157	0.158	0.15467	0.00493	-0.03063	-1.16	0.49
27		0.154	0.156	0.160	0.15667	0.00306	-0.02863	-1.08	0.30
28		0.188	0.185	0.191	0.18793	0.00281	0.00263	0.10	0.28

Average of Cell Averages
 Standard Deviation of Cell Averages
 Repeatability Standard Deviation
 Reproducibility Standard Deviation

X-bar	0.185
$s_{X\bar{}}{}^2$	0.027
s_r	0.01010
s_R	0.028



Binder E

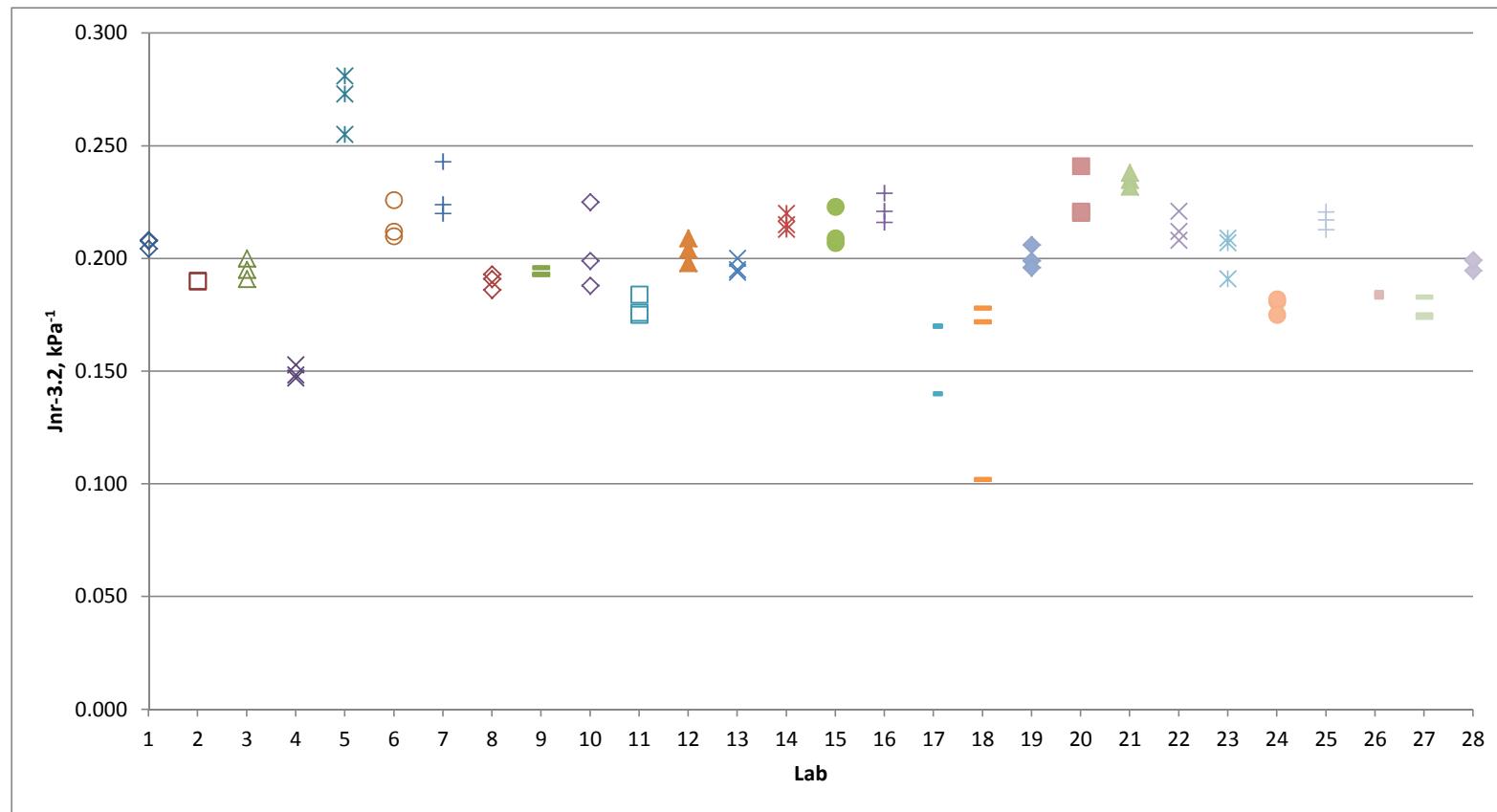
PG 76-22

Jnr (3.2 kPa)

Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		0.208	0.208	0.204	0.20680	0.00209	0.00615	0.24	0.19
2		0.190	0.190	0.190	0.19000	0.00000	-0.01065	-0.41	0.00
3		0.200	0.195	0.191	0.19533	0.00451	-0.00531	-0.21	0.40
4		0.148	0.153	0.147	0.14933	0.00308	-0.05131	-1.99	0.28
5		0.281	0.273	0.255	0.26967	0.01332	0.06902	2.68	1.20
6		0.212	0.226	0.210	0.21600	0.00872	0.01535	0.60	0.78
7		0.220	0.224	0.243	0.22900	0.01229	0.02835	1.10	1.10
8		0.193	0.191	0.186	0.19000	0.00361	-0.01065	-0.41	0.32
9		0.193	0.196	0.193	0.19400	0.00173	-0.00665	-0.26	0.16
10		0.225	0.199	0.188	0.20400	0.01900	0.00335	0.13	1.71
11		0.176	0.184	0.175	0.17833	0.00493	-0.02231	-0.87	0.44
12		0.204	0.198	0.209	0.20367	0.00551	0.00302	0.12	0.49
13		0.195	0.194	0.200	0.19633	0.00321	-0.00431	-0.17	0.29
14		0.215	0.213	0.220	0.21600	0.00361	0.01535	0.60	0.32
15		0.223	0.207	0.209	0.21300	0.00872	0.01235	0.48	0.78
16		0.229	0.216	0.221	0.22200	0.00652	0.02135	0.83	0.59
17		0.170	0.140	0.170	0.16000	0.01732	-0.04065	-1.58	1.55
18		0.102	0.172	0.178	0.15067	0.04225	-0.04998	-1.94	3.79
19		0.199	0.206	0.196	0.20033	0.00513	-0.00031	-0.01	0.46
20		0.220	0.241	0.221	0.22747	0.01181	0.02682	1.04	1.06
21		0.235	0.238	0.232	0.23500	0.00300	0.03435	1.33	0.27
22		0.208	0.212	0.221	0.21367	0.00666	0.01302	0.51	0.60
23		0.191	0.207	0.209	0.20233	0.00987	0.00169	0.07	0.89
24		0.181	0.182	0.175	0.17933	0.00379	-0.02131	-0.83	0.34
25		0.213	0.217	0.221	0.21687	0.00396	0.01622	0.63	0.35
26		0.183	0.184	0.185	0.18400	0.00100	-0.01665	-0.65	0.09
27		0.175	0.183	0.174	0.17733	0.00493	-0.02331	-0.90	0.44
28		0.199	0.195	0.199	0.19766	0.00265	-0.00299	-0.12	0.24

Average of Cell Averages
 Standard Deviation of Cell Averages
 Repeatability Standard Deviation
 Reproducibility Standard Deviation

X-bar	0.201
s _{X-bar}	0.026
s _r	0.01114
s _R	0.027
	0.027



Binder E

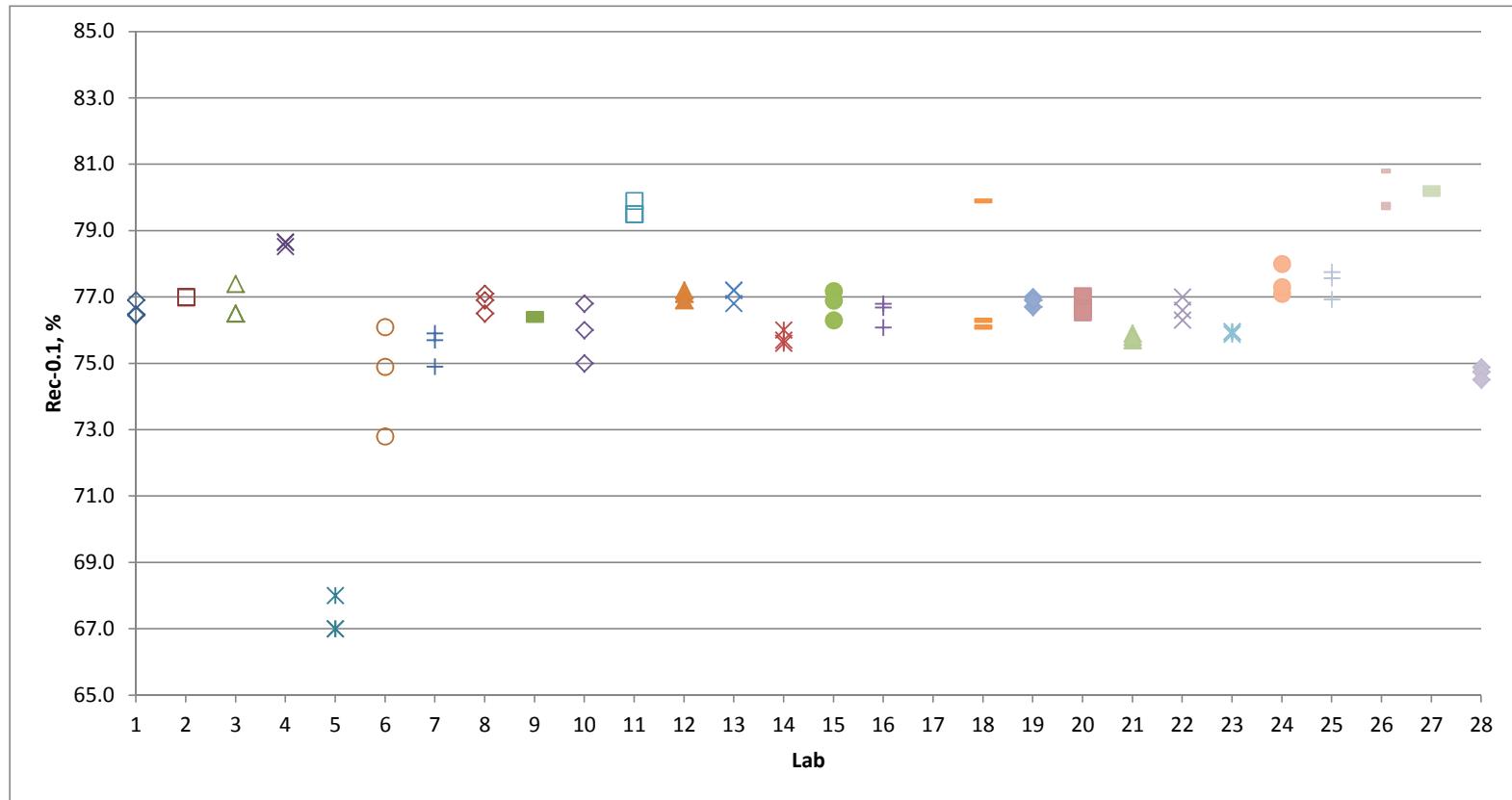
PG 76-22

Recovery (0.1 kPa)

Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		76.5	76.5	76.9	76.610	0.252	0.027	0.01	0.40
2		77.0	77.0	77.0	77.000	0.000	0.417	0.18	0.00
3		76.5	76.5	77.4	76.800	0.520	0.217	0.09	0.82
4		78.5	78.7	78.6	78.607	0.076	2.024	0.88	0.12
5		67.0	68.0	67.0	67.333	0.577	-9.250	-4.01	0.91
6		72.8	74.9	76.1	74.600	1.670	-1.983	-0.86	2.64
7		75.7	75.9	74.9	75.500	0.529	-1.083	-0.47	0.84
8		76.5	77.1	76.9	76.833	0.306	0.250	0.11	0.48
9		76.4	76.3	76.5	76.400	0.100	-0.183	-0.08	0.16
10		75.0	76.0	76.8	75.933	0.902	-0.650	-0.28	1.43
11		79.5	79.5	79.9	79.633	0.231	3.050	1.32	0.37
12		77.1	77.2	76.9	77.067	0.153	0.484	0.21	0.24
13		77.2	77.2	76.8	77.067	0.231	0.484	0.21	0.37
14		75.7	76.0	75.6	75.767	0.208	-0.816	-0.35	0.33
15		76.3	77.2	76.9	76.790	0.448	0.207	0.09	0.71
16		76.1	76.8	76.7	76.517	0.382	-0.066	-0.03	0.60
17									
18		79.9	76.3	76.1	77.433	2.139	0.850	0.37	3.38
19		77.0	76.7	76.9	76.867	0.153	0.284	0.12	0.24
20		77.0	76.7	76.5	76.737	0.251	0.154	0.07	0.40
21		75.9	75.7	75.8	75.800	0.100	-0.783	-0.34	0.16
22		77.0	76.6	76.3	76.633	0.351	0.050	0.02	0.56
23		76.0	75.9	75.9	75.923	0.047	-0.660	-0.29	0.07
24		77.1	77.3	78.0	77.467	0.473	0.884	0.38	0.75
25		77.6	77.8	76.9	77.410	0.435	0.827	0.36	0.69
26		80.8	79.7	79.8	80.100	0.608	3.517	1.53	0.96
27		80.1	80.2	80.3	80.200	0.100	3.617	1.57	0.16
28		74.9	74.7	74.5	74.712	0.189	-1.871	-0.81	0.30

Average of Cell Averages
 Standard Deviation of Cell Averages
 Repeatability Standard Deviation
 Reproducibility Standard Deviation

X-bar 76.583
 $s_{X\bar{x}}$ 2.306
 s_r 0.63255 2.363
 s_R 2.363



Binder E

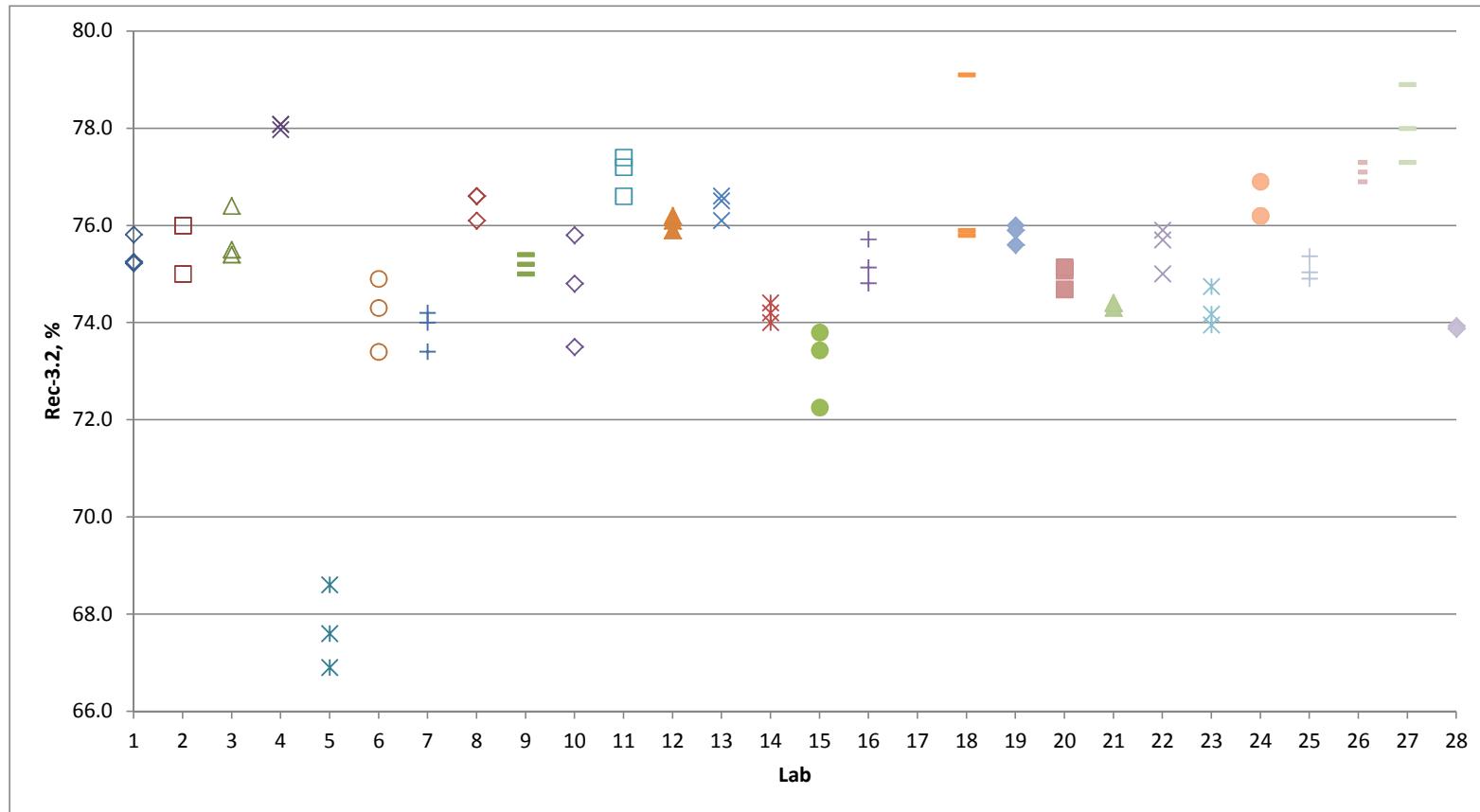
PG 76-22

Recovery (3.2 kPa)

Lab No.	Lab Name	Results, x					h	k
		1	2	3	Average	s		
1		75.2	75.3	75.8	75.42667	0.33232	0.18153	0.09
2		75.0	76.0	76.0	75.66667	0.57735	0.42153	0.21
3		75.4	75.5	76.4	75.76667	0.55076	0.52153	0.27
4		78.0	78.1	78.1	78.04000	0.06083	2.79487	1.42
5		66.9	67.6	68.6	67.70000	0.85440	-7.54513	-3.84
6		74.9	73.4	74.3	74.20000	0.75498	-1.04513	-0.53
7		74.2	74.0	73.4	73.86667	0.41633	-1.37847	-0.70
8		76.6	76.1	76.6	76.43333	0.28868	1.18820	0.60
9		75.2	75.0	75.4	75.20000	0.20000	-0.04513	-0.02
10		73.5	74.8	75.8	74.70000	1.15326	-0.54513	-0.28
11		77.2	76.6	77.4	77.06667	0.41633	1.82153	0.93
12		76.1	76.2	75.9	76.06667	0.15275	0.82153	0.42
13		76.5	76.6	76.1	76.40000	0.26458	1.15487	0.59
14		74.2	74.4	74.0	74.20000	0.20000	-1.04513	-0.53
15		72.3	73.8	73.4	73.16000	0.80951	-2.08513	-1.06
16		74.8	75.7	75.1	75.21667	0.45622	-0.02847	-0.01
17								
18		79.1	75.9	75.8	76.93333	1.87705	1.68820	0.86
19		76.0	75.6	75.9	75.83333	0.20817	0.58820	0.30
20		75.1	74.7	75.1	74.96333	0.24786	-0.28180	-0.14
21		74.4	74.3	74.4	74.36667	0.05774	-0.87847	-0.45
22		75.9	75.7	75.0	75.53333	0.47258	0.28820	0.15
23		74.7	74.2	74.0	74.28667	0.40772	-0.95847	-0.49
24		76.2	76.2	76.9	76.43333	0.40415	1.18820	0.60
25		75.4	74.9	75.0	75.09667	0.23714	-0.14847	-0.08
26		77.3	76.9	77.1	77.10000	0.20000	1.85487	0.94
27		78.0	77.3	78.9	78.06667	0.80208	2.82153	1.44
28		73.9	73.9	73.9	73.89529	0.03020	-1.34984	-0.69

Average of Cell Averages
 Standard Deviation of Cell Averages
 Repeatability Standard Deviation
 Reproducibility Standard Deviation

X-bar	75.245
$s_{X\bar{}}$	1.965
s_r	0.60161
s_R	2.026



Binder E

PG 76-22

Jnr-Diff

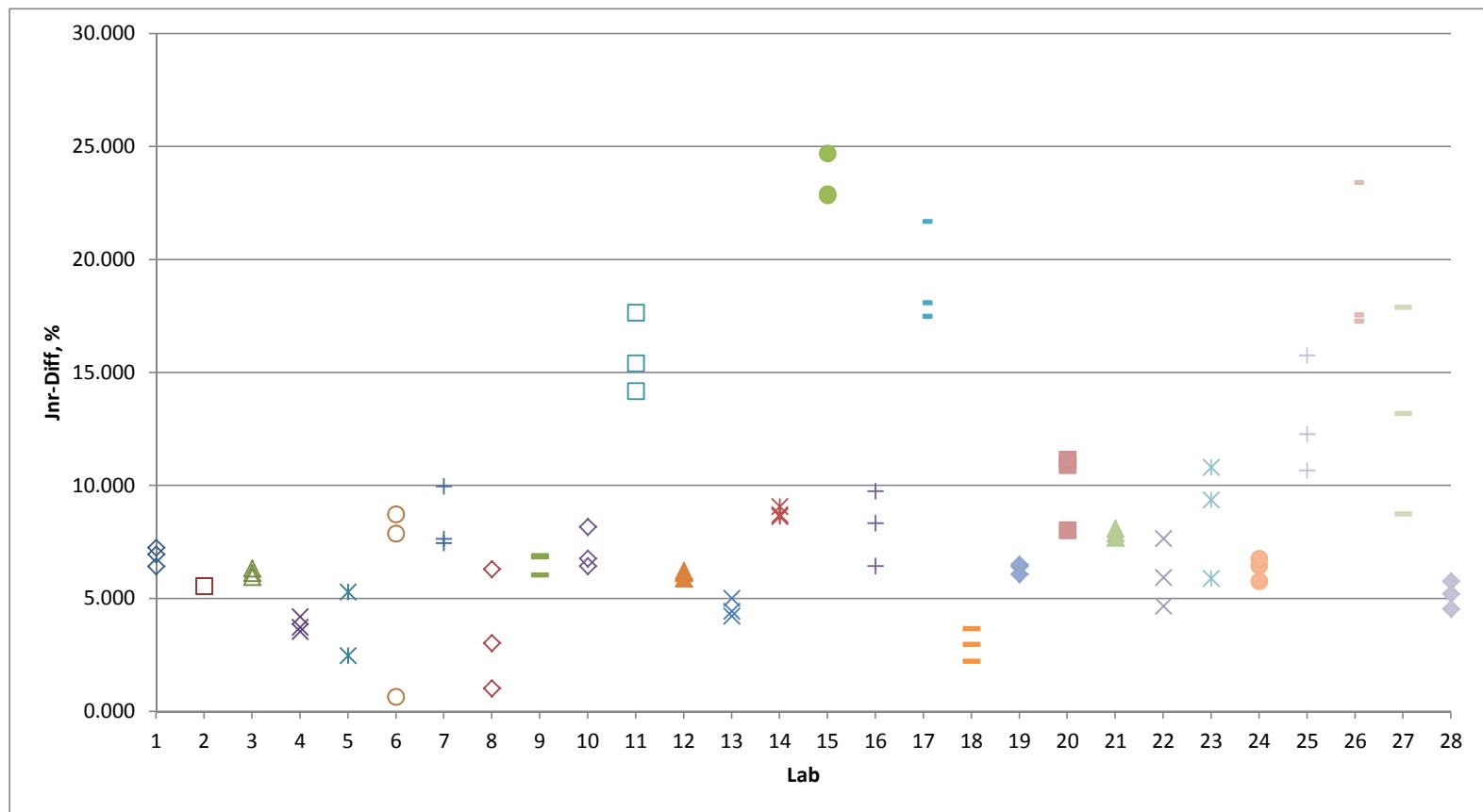
Lab No.	Lab Name	Results, x			Average	s	d	h	k
		1	2	3					
1		7.250	6.960	6.430	6.88000	0.41581	-1.78763	-0.34	0.22
2		5.556	5.556	5.556	5.55556	0.00000	-3.11207	-0.60	0.00
3		6.132	5.966	6.338	6.14533	0.18636	-2.52229	-0.49	0.10
4		4.202	3.547	3.732	3.82700	0.33768	-4.84063	-0.93	0.18
5		2.480	5.290		3.88500	1.98697	-4.78263	-0.92	1.06
6		0.653	7.881	8.738	5.75733	4.44120	-2.91029	-0.56	2.36
7		7.458	9.973	7.645	8.35867	1.40118	-0.30896	-0.06	0.74
8		1.039	6.304	3.032	3.45833	2.65827	-5.20929	-1.00	1.41
9		6.910	6.852	6.051	6.60433	0.48008	-2.06329	-0.40	0.26
10		8.173	6.777	6.435	7.12833	0.92073	-1.53929	-0.30	0.49
11		14.191	17.653	15.411	15.75167	1.75596	7.08404	1.36	0.93
12		6.128	5.896	6.224	6.08267	0.16863	-2.58496	-0.50	0.09
13		4.438	4.221	5.007	4.55533	0.40592	-4.11229	-0.79	0.22
14		8.628	9.069	8.712	8.80300	0.23416	0.13537	0.03	0.12
15		24.710	22.910	22.850	23.49000	1.05698	14.82237	2.85	0.56
16		8.341	6.435	9.757	8.17767	1.66701	-0.48996	-0.09	0.89
17		21.700	18.100	17.500	19.10000	2.27156	10.43237	2.01	1.21
18		3.681	2.977	2.240	2.96600	0.72056	-5.70163	-1.10	0.38
19		6.430	6.504	6.084	6.33933	0.22420	-2.32829	-0.45	0.12
20		10.910	11.150	8.028	10.02933	1.73735	1.36171	0.26	0.92
21		7.900	8.100	7.700	7.90000	0.20000	-0.76763	-0.15	0.11
22		5.932	4.665	7.653	6.08333	1.49974	-2.58429	-0.50	0.80
23		5.892	9.362	10.804	8.68600	2.52481	0.01837	0.00	1.34
24		5.772	6.471	6.775	6.33933	0.51430	-2.32829	-0.45	0.27
25		12.280	15.760	10.680	12.90667	2.59733	4.23904	0.82	1.38
26		23.427	17.564	17.280	19.42367	3.46990	10.75604	2.07	1.84
27		13.200	17.900	8.750	13.28333	4.57557	4.61571	0.89	2.43
28		5.775	5.213	4.541	5.17634	0.61796	-3.49129	-0.67	0.33

Average of Cell Averages X-bar 8.668

Standard Deviation of Cell Averages S_{X-bar} 5.200

Repeatability Standard Deviation S_r 1.88139 5.422

Reproducibility Standard Deviation S_R 5.422



Jnr (0.1 kPa)

ID	Binder	X-bar	S _{X-bar}	S _r	S _R	r	R	Repeatability		Reproducibility	
								1s%	d2s%	1s%	d2s%
A	PG 58-28	2.70129	0.23103	0.07352	0.23870	0.20586	0.66837	2.7%	7.6%	8.8%	24.7%
B	PG 64-22	2.35547	0.20889	0.08945	0.22129	0.25045	0.61962	3.8%	10.6%	9.4%	26.3%
C	PG 64-28	0.99139	0.13823	0.16227	0.19147	0.45436	0.53612	16.4%	45.8%	19.3%	54.1%
C64	PG 64-28	2.39561	0.25444	0.12250	0.27339	0.34300	0.76550	5.1%	14.3%	11.4%	32.0%
D	PG 70-28	0.10115	0.01832	0.00631	0.01903	0.01766	0.05328	6.2%	17.5%	18.8%	52.7%
D64	PG 70-28	0.23372	0.03953	0.00857	0.04014	0.02400	0.11240	3.7%	10.3%	17.2%	48.1%
E	PG 76-22	0.18530	0.02650	0.01010	0.02776	0.02828	0.07772	5.5%	15.3%	15.0%	41.9%

Jnr (3.2 kPa)

ID	Binder	X-bar	S _{X-bar}	S _r	S _R	r	R	Repeatability		Reproducibility	
								1s%	d2s%	1s%	d2s%
A	PG 58-28	2.97123	0.23906	0.13870	0.26453	0.38837	0.74068	4.7%	13.1%	8.9%	24.9%
B	PG 64-22	2.59292	0.22707	0.08968	0.23858	0.25110	0.66804	3.5%	9.7%	9.2%	25.8%
C	PG 64-28	1.34383	0.16748	0.05887	0.17424	0.16483	0.48788	4.4%	12.3%	13.0%	36.3%
C64	PG 64-28	3.31480	0.32429	0.18469	0.35764	0.51712	1.00139	5.6%	15.6%	10.8%	30.2%
D	PG 70-28	0.10677	0.01946	0.00486	0.01986	0.01361	0.05560	4.6%	12.7%	18.6%	52.1%
D64	PG 70-28	0.28253	0.05638	0.01317	0.05740	0.03687	0.16071	4.7%	13.1%	20.3%	56.9%
E	PG 76-22	0.20065	0.02577	0.01114	0.02732	0.03120	0.07651	5.6%	15.5%	13.6%	38.1%

Recovery (0.1 kPa)

ID	Binder	X-bar	S _{X-bar}	S _r	S _R	r	R	Repeatability		Reproducibility	
								1s%	d2s%	1s%	d2s%
A	PG 58-28	3.46081	1.26969	1.03259	1.52412	2.89126	4.26754	29.8%	83.5%	44.0%	123.3%
B	PG 64-22	3.74278	1.53603	1.29802	1.86618	3.63446	5.22531	34.7%	97.1%	49.9%	139.6%
C	PG 64-28	24.19462	2.40892	0.90147	2.51886	2.52412	7.05281	3.7%	10.4%	10.4%	29.2%
C64	PG 64-28	17.10437	1.83866	0.90671	1.98210	2.53878	5.54989	5.3%	14.8%	11.6%	32.4%
D	PG 70-28	74.57164	2.51841	0.56013	2.55960	1.56835	7.16688	0.8%	2.1%	3.4%	9.6%
D64	PG 70-28	69.28633	2.20877	0.40283	2.23312	1.12793	6.25274	0.6%	1.6%	3.2%	9.0%
E	PG 76-22	76.58291	2.30617	0.63255	2.36329	1.77113	6.61722	0.8%	2.3%	3.1%	8.6%

Recovery (3.2 kPa)

ID	Binder	X-bar	S _{X-bar}	S _r	S _R	r	R	Repeatability		Reproducibility	
								1s%	d2s%	1s%	d2s%
A	PG 58-28	0.71720	0.48676	0.14224	0.50042	0.39827	1.40117	19.8%	55.5%	69.8%	195.4%
B	PG 64-22	1.04096	0.66821	0.46883	0.77009	1.31271	2.15625	45.0%	126.1%	74.0%	207.1%
C	PG 64-28	6.72827	2.14221	0.46437	2.17551	1.30024	6.09143	6.9%	19.3%	32.3%	90.5%
C64	PG 64-28	2.17981	0.85302	0.16252	0.86328	0.45505	2.41718	7.5%	20.9%	39.6%	110.9%
D	PG 70-28	73.27724	2.53696	0.45874	2.56446	1.28448	7.18049	0.6%	1.8%	3.5%	9.8%
D64	PG 70-28	63.10381	3.49211	0.64925	3.53212	1.81791	9.88994	1.0%	2.9%	5.6%	15.7%
E	PG 76-22	75.24513	1.96508	0.60161	2.02555	1.68452	5.67153	0.8%	2.2%	2.7%	7.5%

Jnr-Diff

ID	Binder	X-bar	S _{X-bar}	S _r	S _R	r	R	Repeatability		Reproducibility	
								1s%	d2s%	1s%	d2s%
A	PG 58-28	10.38724	1.70588	1.74249	2.22131	4.87898	6.21966	16.8%	47.0%	21.4%	59.9%
B	PG 64-22	10.03418	1.79695	2.04955	2.45549	5.73873	6.87539	20.4%	57.2%	24.5%	68.5%
C	PG 64-28	33.04132	4.61921	5.44930	6.41355	15.25803	17.95795	16.5%	46.2%	19.4%	54.3%
C64	PG 64-28	38.51883	3.52796	2.13770	3.93612	5.98557	11.02113	5.5%	15.5%	10.2%	28.6%
D	PG 70-28	6.05662	6.65052	10.05720	10.56698	28.16017	29.58754	166.1%	464.9%	174.5%	488.5%
D64	PG 70-28	20.44080	5.72672	1.79341	5.91097	5.02155	16.55072	8.8%	24.6%	28.9%	81.0%
E	PG 76-22	8.66763	5.19999	1.88139	5.42214	5.26790	15.18200	21.7%	60.8%	62.6%	175.2%

h

Critical Value = 2.63

2.63 2.63 2.63 2.63 2.63 2.63 2.63

Jnr (0.1 kPa)

Lab No.	Lab Name	Material						
		Binder A	Binder B	Binder C	Binder C64	Binder D	Binder D64	Binder E
1		0.35	0.37	0.28	-0.11	0.55	0.50	0.31
2		0.18	-0.47	-0.03	0.23	-0.06	-0.26	-0.20
3		0.49	0.48	-0.14	-0.88	0.26	-0.02	-0.06
4		-2.01	-2.29	-1.33	-1.60	-0.95	-1.08	-1.56
5		-1.12	-1.36	-0.30		1.72		2.99
6		0.42	0.67	-2.63		-0.46		0.72
7		0.14	-0.02	0.42		-0.03		0.99
8		-0.44	-0.94	0.57		-0.94		-0.06
9		-1.00	-0.92	-0.83	-1.07	-0.55	-0.84	-0.14
10		-0.75	-0.30	-0.42	0.10	0.19	-0.28	0.20
11		-0.18	0.31	-0.62	-0.29	-1.26	-0.92	-1.19
12		-0.28	0.07	-0.05	-0.25	0.03	0.13	0.25
13		-0.56	-0.05	-0.87	-1.14	-0.46	-0.54	0.10
14		-0.16	0.75	0.30	0.14	0.14	0.20	0.49
15		0.40	-0.61	0.20	-0.81	-0.08	-0.73	-0.48
16		1.83	1.45	1.10	1.07	0.70	0.27	0.75
17		1.58	1.17	0.11		-1.39		-1.96
18		-2.49	-2.54	-1.67	-1.49	-1.82	-1.74	-1.42
19		-0.42	-0.10	-0.74	-0.75	0.36	0.14	0.11
20		0.70	0.27	1.81	0.31	0.78	0.46	0.81
21		1.38	1.95	0.86	1.85	2.87	3.33	1.22
22		1.01	0.54	0.33	0.47	0.14	0.09	0.59
23		0.36	0.42	1.74	2.59	1.10	1.60	0.03
24		-0.26	0.05	-0.25	0.04	-0.32	-0.20	-0.63
25		1.16	0.81	1.90	0.66	1.20	0.74	0.26
26		0.21	0.65	0.17	0.39	-1.26	-0.51	-1.16
27		0.56	0.36	-0.06	0.61	-0.63	-0.41	-1.08
28		-1.10	-0.72	0.16	-0.05	0.19	0.06	0.10

exceeds h

exceeds h-0.5

h

Critical Value = 2.63

2.63 2.63 2.63 2.63 2.63 2.63 2.63

Jnr (3.2 kPa)

Lab No.	Lab Name	Material						
		Binder A	Binder B	Binder C	Binder C64	Binder D	Binder D64	Binder E
1		0.27	0.27	0.04	-0.27	0.46	0.40	0.24
2		0.11	-0.60	-0.36	-0.01	-0.35	-0.52	-0.41
3		0.46	0.36	-0.28	-0.84	0.20	-0.09	-0.21
4		-2.18	-2.35	-1.72	-1.87	-1.12	-1.19	-1.99
5		-1.20	-1.33	-1.00		1.23		2.68
6		0.34	0.54	1.00		0.41		0.60
7		0.46	0.53	0.22		-0.23		1.10
8		-0.58	-1.02	0.12		-1.12		-0.41
9		-0.96	-0.87	-1.09	-1.07	-0.71	-0.97	-0.26
10		-0.76	-0.33	-0.72	-0.09	0.10	-0.39	0.13
11		-0.20	0.26	-0.84	-0.32	-1.08	-0.62	-0.87
12		-0.23	0.06	-0.22	-0.25	-0.06	0.06	0.12
13		-0.63	-0.12	-1.14	-1.12	-0.69	-0.68	-0.17
14		-0.04	0.78	0.17	0.14	0.06	0.11	0.60
15		-0.22	-0.06	0.72	0.06	0.49	-0.04	0.48
16		1.81	1.51	0.97	1.09	0.65	0.11	0.83
17		1.65	1.21	0.34		-1.26		-1.58
18		-2.30	-2.60	-1.89	-1.46	-1.89	-1.62	-1.94
19		-0.50	-0.19	-0.86	-0.88	0.29	0.07	-0.01
20		0.64	0.15	1.87	0.32	0.81	0.48	1.04
21		1.41	1.84	0.69	1.54	3.10	3.46	1.33
22		1.05	0.61	0.32	0.59	-0.01	0.07	0.51
23		0.32	0.30	1.76	2.66	1.14	1.58	0.07
24		0.04	0.11	-0.38	0.17	-0.43	-0.28	-0.83
25		1.21	0.65	2.18	0.74	1.30	0.78	0.63
26		0.20	0.63	0.10	0.34	-0.90	-0.30	-0.65
27		0.66	0.40	-0.13	0.66	-0.35	-0.24	-0.90
28		-0.87	-0.74	0.09	-0.12	-0.05	-0.18	-0.12

exceeds h

exceeds h-0.5

h

Critical Value = 2.63

2.63 2.63 2.63 2.63 2.63 2.63 2.63

Recovery (0.1 kPa)

Lab No.	Lab Name	Material						
		Binder A	Binder B	Binder C	Binder C64	Binder D	Binder D64	Binder E
1		-0.33	-0.02	-0.09	-0.04	-0.17	-0.37	0.01
2		0.42	0.60	0.33	0.49	0.17	0.17	0.18
3		-0.26	-0.22	0.43	0.90	0.00	0.07	0.09
4		0.76	1.00	1.26	0.99	0.41	0.64	0.88
5		-0.10	0.17	-0.77		-3.01		-4.01
6		-2.41	-2.28	-2.61		-0.82		-0.86
7		1.42	2.32	-0.27		0.20		-0.47
8		0.00	0.80	-0.94		0.65		0.11
9		1.24	0.41	1.21	1.43	0.65	1.02	-0.08
10		0.42	0.17	0.25	-0.49	-0.16	0.02	-0.28
11		-0.07	-0.14	0.42	-0.02	1.49	1.18	1.32
12		0.29	0.15	0.27	0.25	0.02	-0.17	0.21
13		-0.07	-0.11	0.98	1.07	0.51	0.56	0.21
14		0.79	0.49	0.06	-0.15	-0.44	-0.61	-0.35
15		-2.73	-2.44	-1.98	-1.57	-0.22	0.29	0.09
16		0.14	0.30	-0.27	-0.33	-0.17	-0.19	-0.03
17								
18		1.06	0.71	2.26	1.65	1.22	1.74	0.37
19		-0.05	-0.05	0.90	0.45	-0.23	-0.31	0.12
20		0.27	0.27	-0.31	0.42	-0.12	-0.10	0.07
21		-0.52	-0.48	-0.68	-1.71	-2.19	-3.28	-0.34
22		0.53	0.54	0.51	0.34	0.18	0.20	0.02
23		0.25	0.25	-0.91	-1.50	-0.90	-1.45	-0.29
24		1.24	0.51	0.75	0.60	0.46	0.28	0.38
25		0.11	-0.25	-0.15	0.25	-0.30	-0.55	0.36
26		-0.27	-0.20	-0.02	-0.42	1.64	0.84	1.53
27		-0.18	-0.20	0.27	-0.44	1.45	0.72	1.57
28		-1.97	-2.29	-0.90	-2.17	-0.34	-0.69	-0.81

exceeds h

exceeds h-0.5

h

Critical Value = 2.63

2.63 2.63 2.63 2.63 2.63 2.63 2.63

Recovery (3.2 kPa)

Lab No.	Lab Name	Material						
		Binder A	Binder B	Binder C	Binder C64	Binder D	Binder D64	Binder E
1		-0.73	-0.54	0.04	-0.14	-0.22	-0.30	0.09
2		0.58	1.44	0.59	0.96	0.68	0.64	0.21
3		-0.72	-0.56	0.28	0.22	0.09	0.17	0.27
4		1.50	1.22	1.30	1.32	0.69	0.99	1.42
5		0.99	2.28	0.78		-2.41		-3.84
6		-1.47	-1.56	-2.11		-0.79		-0.53
7		-0.79	0.24	-0.11		0.44		-0.70
8		1.13	0.89	0.22		1.01		0.60
9		1.06	0.84	1.00	1.00	0.86	1.21	-0.02
10		-0.17	-0.31	0.43	-0.41	-0.14	0.29	-0.28
11		-0.79	-0.81	0.42	-0.17	1.18	0.62	0.93
12		-0.45	-0.41	0.24	-0.09	0.10	-0.08	0.42
13		-0.45	-0.51	0.80	0.30	0.82	0.82	0.59
14		1.27	0.54	0.17	0.61	-0.37	-0.38	-0.53
15		-1.47	-1.56	-3.14	-2.56	-0.89	-0.67	-1.06
16		0.82	0.44	-0.16	0.45	-0.44	-0.08	-0.01
17								
18		-0.04	0.79	1.59	0.96	1.35	1.59	0.86
19		-0.45	-0.46	0.67	0.14	-0.19	-0.17	0.30
20		1.06	0.68	-0.44	0.70	-0.28	-0.28	-0.14
21		-0.93	-0.96	-0.27	-0.99	-2.75	-3.40	-0.45
22		0.99	0.69	0.22	0.65	0.27	0.21	0.15
23		1.11	0.61	-0.55	-0.08	-1.03	-1.47	-0.49
24		1.06	0.59	0.56	0.65	0.61	0.44	0.60
25		0.54	0.27	-0.66	0.31	-0.61	-0.71	-0.08
26		-0.72	-0.91	-0.18	-0.37	1.02	0.37	0.94
27		-1.47	-1.36	-0.15	-0.91	0.98	0.25	1.44
28		-1.47	-1.56	-1.54	-2.56	0.01	-0.06	-0.69

exceeds h

exceeds h-0.5

h

Critical Value = 2.63

2.63 2.63 2.63 2.63 2.63 2.63 2.63

Jnr-Diff

Lab No.	Lab Name	Material						
		Binder A	Binder B	Binder C	Binder C64	Binder D	Binder D64	Binder E
1		-0.76	-0.51	-0.44	-0.63	-0.29	-0.02	-0.34
2		-0.68	-0.65	-0.64	-1.02	-0.91	-1.22	-0.60
3		-0.50	-0.66	0.11	0.46	-0.36	-0.23	-0.49
4		-0.47	-0.15	-0.51	-0.64	-0.70	-1.33	-0.93
5		-0.82	-0.65	-2.98		-0.85		-0.92
6		-1.81	-0.36	-0.75		4.01		-0.56
7		1.43	3.40	-0.31		-0.55		-0.06
8		-0.78	-0.11	-1.18		-0.69		-1.00
9		0.37	0.38	-0.08	0.34	-0.64	-1.19	-0.40
10		-0.03	-0.17	-0.46	-0.79	-0.31	-0.63	-0.30
11		-0.29	-0.24	-0.03	-0.03	0.59	0.84	1.36
12		0.13	-0.05	-0.05	0.04	-0.38	-0.14	-0.50
13		-0.41	-0.30	-0.15	0.46	-0.76	-0.96	-0.79
14		0.47	0.09	-0.03	-0.11	-0.31	-0.16	0.03
15		3.15	3.21	1.98	3.89	1.62	2.86	2.85
16		-0.50	0.21	-0.28	-0.28	-0.19	-0.42	-0.09
17		0.38	-0.48	3.09		0.31		2.01
18		1.22	-0.69	0.43	0.70	-0.38	-0.85	-1.10
19		-0.51	-0.45	0.42	-0.32	-0.31	-0.10	-0.45
20		-0.72	-0.66	0.09	-0.10	0.00	0.42	0.26
21		-0.46	-0.58	-0.33	-1.55	0.37	1.80	-0.15
22		-0.34	0.37	0.39	0.26	-0.41	0.01	-0.50
23		-0.57	-0.62	0.03	-0.51	0.02	0.83	0.00
24		1.43	0.36	0.22	0.46	-0.41	-0.41	-0.45
25		-0.36	-0.79	0.68	0.05	0.23	0.62	0.82
26		-0.32	-0.12	0.21	-0.35	1.25	0.62	2.07
27		0.09	0.23	0.34	-0.03	0.79	0.57	0.89
28		1.66	-0.02	0.23	-0.28	-0.73	-0.88	-0.67

exceeds h

exceeds h-0.5

k

Critical Value = 2.23

2.23 2.23 2.23 2.23 2.23 2.23 2.23

Jnr (0.1 kPa)

Lab No.	Lab Name	Material						
		Binder A	Binder B	Binder C	Binder C64	Binder D	Binder D64	Binder E
1		0.48	0.10	0.02	0.74	0.18	0.52	0.13
2		0.16	0.28	0.13	0.54	0.00	0.67	0.00
3		0.40	0.35	0.14	0.13	0.00	0.12	0.45
4		0.53	0.55	0.04	0.28	0.37	0.34	0.32
5		0.14	0.13	0.07		0.33		0.81
6		0.46	0.60	5.02		3.82		0.97
7		1.37	2.93	0.25		1.06		1.23
8		2.31	0.57	0.37		0.00		0.63
9		1.01	0.18	0.03	0.12	0.57	0.68	0.15
10		0.72	0.76	0.20	0.61	0.37	1.66	1.57
11		0.52	0.48	0.30	0.61	0.42	1.18	0.25
12		0.73	0.61	0.05	0.97	0.40	0.23	0.50
13		0.56	0.54	0.01	0.08	0.40	0.24	0.26
14		0.33	0.56	0.16	0.38	0.18	0.86	0.35
15		1.42	3.04	0.59	2.22	0.09	0.81	0.55
16		0.41	0.58	0.19	0.66	0.58	2.11	0.53
17		0.79	0.00	1.00		1.80		1.14
18		0.77	1.37	0.44	2.28	0.74	0.31	4.10
19		0.09	0.29	0.18	0.82	1.06	1.31	0.41
20		0.22	0.27	0.40	1.64	0.32	1.53	0.92
21		0.66	0.29	0.31	0.99	0.75	0.41	0.21
22		0.42	0.18	0.10	0.04	0.24	0.60	0.45
23		0.39	0.47	0.22	1.31	0.09	0.61	0.51
24		0.38	0.55	0.36	0.85	0.64	0.23	0.40
25		1.95	1.07	0.36	0.74	1.89	2.15	0.63
26		0.24	0.25	0.22	0.39	0.32	0.47	0.49
27		0.60	1.28	0.31	1.22	0.48	0.37	0.30
28		2.91	1.14	0.20	0.83	0.84	1.21	0.28

exceeds k

exceeds k-0.5

k

Critical Value = 2.23

2.23 2.23 2.23 2.23 2.23 2.23 2.23

Jnr (3.2 kPa)

Lab No.	Lab Name	Material						
		Binder A	Binder B	Binder C	Binder C64	Binder D	Binder D64	Binder E
1		0.21	0.03	0.11	0.57	0.22	0.56	0.19
2		0.04	0.45	0.52	0.62	0.00	0.44	0.00
3		0.10	0.27	0.26	0.12	0.12	0.16	0.40
4		0.17	0.40	0.33	0.19	0.50	0.05	0.28
5		0.09	0.02	0.26		0.66		1.20
6		0.43	0.67	0.87		1.86		0.78
7		0.43	1.30	0.66		1.24		1.10
8		1.23	0.38	1.11		0.36		0.32
9		0.46	0.07	0.35	0.26	0.74	0.53	0.16
10		0.31	0.91	0.81	0.48	0.66	1.48	1.71
11		0.32	0.47	1.04	0.35	0.63	1.43	0.44
12		0.25	0.69	0.14	0.94	0.52	0.27	0.49
13		0.28	0.54	0.06	0.03	0.63	0.29	0.29
14		0.38	0.88	0.64	0.45	0.00	0.73	0.32
15		4.57	3.61	2.59	2.72	0.31	0.60	0.78
16		0.34	0.93	0.72	0.53	0.71	2.14	0.59
17		0.83	0.64	0.00		2.96		1.55
18		0.48	1.82	1.90	2.26	1.24	0.13	3.79
19		0.06	0.37	1.11	0.77	1.46	0.94	0.46
20		0.16	0.32	1.45	1.47	1.06	1.71	1.06
21		0.44	0.23	1.64	0.82	1.25	0.42	0.27
22		0.12	0.17	0.34	0.17	0.52	0.42	0.60
23		0.33	0.41	0.83	1.48	0.54	0.22	0.89
24		0.22	0.76	0.85	0.59	0.72	0.15	0.34
25		1.22	0.57	1.25	0.72	1.31	2.52	0.35
26		0.15	0.29	0.71	0.26	0.52	0.65	0.09
27		0.37	1.18	1.12	1.01	0.21	0.53	0.44
28		1.16	1.47	1.02	0.57	1.14	1.00	0.24

exceeds k

exceeds k-0.5

k

Critical Value = 2.23

2.23 2.23 2.23 2.23 2.23 2.23 2.23

Recovery (0.1 kPa)

Lab No.	Lab Name	Material						
		Binder A	Binder B	Binder C	Binder C64	Binder D	Binder D64	Binder E
1		0.24	0.20	0.04	0.67	0.50	0.45	0.40
2		0.00	0.44	0.00	0.00	0.00	1.43	0.00
3		0.30	0.15	1.08	0.17	0.21	0.14	0.82
4		1.40	0.29	0.65	0.27	0.30	1.27	0.12
5		0.56	0.00	0.64		1.79		0.91
6		0.00	0.31	0.00		0.82		2.64
7		1.80	3.76	1.86		0.98		0.84
8		1.13	0.55	1.51		0.54		0.48
9		0.37	1.38	0.58	0.54	0.54	0.14	0.16
10		0.42	0.08	0.44	0.51	0.21	1.65	1.43
11		0.34	0.25	0.59	0.67	1.19	1.29	0.37
12		0.53	0.04	0.28	0.81	0.37	0.25	0.24
13		0.24	0.40	0.28	0.17	0.68	0.38	0.37
14		0.37	0.40	0.36	0.35	0.10	0.38	0.33
15		0.00	0.00	1.40	2.23	0.31	0.36	0.71
16		0.40	0.16	0.75	0.35	1.68	1.66	0.60
17								
18		3.86	2.78	2.02	3.20	1.54	1.45	3.38
19		0.17	0.09	0.28	0.45	0.18	1.49	0.24
20		0.02	0.20	0.38	1.04	0.86	1.52	0.40
21		0.30	0.08	0.17	0.67	0.74	0.29	0.16
22		0.15	0.04	0.17	0.17	0.74	0.72	0.56
23		0.07	0.08	0.90	0.79	0.24	0.62	0.07
24		0.69	0.42	2.23	0.86	1.27	0.43	0.75
25		0.89	1.33	0.77	0.79	3.09	0.65	0.69
26		0.02	0.09	1.07	0.46	0.47	1.00	0.96
27		0.06	0.16	0.86	0.76	0.68	1.00	0.16
28		1.30	0.24	1.40	0.85	0.30	1.11	0.30

exceeds k

exceeds k-0.5

k

Critical Value = 2.23

2.23 2.23 2.23 2.23 2.23 2.23 2.23

Recovery (3.2 kPa)

Lab No.	Lab Name	Material						
		Binder A	Binder B	Binder C	Binder C64	Binder D	Binder D64	Binder E
1		0.21	0.03	0.12	1.28	1.05	0.62	0.55
2		0.00	0.00	0.00	0.00	0.00	0.89	0.96
3		0.41	0.12	0.69	0.36	0.58	0.15	0.92
4		0.03	0.02	0.14	0.36	0.24	0.52	0.10
5		0.00	3.94	0.57		0.13		1.42
6		0.00	0.00	1.84		2.07		1.25
7		0.81	2.59	0.65		1.33		0.69
8		0.41	0.12	0.86		0.33		0.48
9		2.26	2.03	1.26	2.16	0.55	0.44	0.33
10		0.41	0.12	0.79	0.71	0.50	1.75	1.92
11		0.81	0.21	1.32	0.94	0.91	1.75	0.69
12		0.70	0.12	0.33	1.23	0.63	0.09	0.25
13		0.00	0.00	0.12	0.36	1.01	0.47	0.44
14		0.39	0.00	0.57	0.62	0.33	0.39	0.33
15		0.00	0.00	0.00	0.00	0.32	0.28	1.35
16		0.11	0.01	0.49	0.48	0.44	1.69	0.76
17								
18		4.28	0.62	3.02	1.07	1.70	0.39	3.12
19		0.00	0.12	0.90	1.07	0.58	1.16	0.35
20		0.12	0.03	0.59	1.66	2.26	2.20	0.41
21		0.41	0.00	0.94	1.28	1.33	0.36	0.10
22		0.00	0.00	0.43	0.36	0.88	0.71	0.79
23		0.20	0.02	0.29	1.09	0.47	0.24	0.68
24		0.41	0.12	1.53	0.36	1.20	0.50	0.67
25		0.22	0.05	0.32	1.74	1.32	1.86	0.39
26		0.81	0.33	0.87	0.36	1.33	0.72	0.33
27		0.00	0.12	1.20	1.23	0.25	0.69	1.33
28		0.00	0.00	0.97	0.00	0.18	0.36	0.05

exceeds k

exceeds k-0.5

k

Critical Value = 2.23

2.23 2.23 2.23 2.23 2.23 2.23 2.23

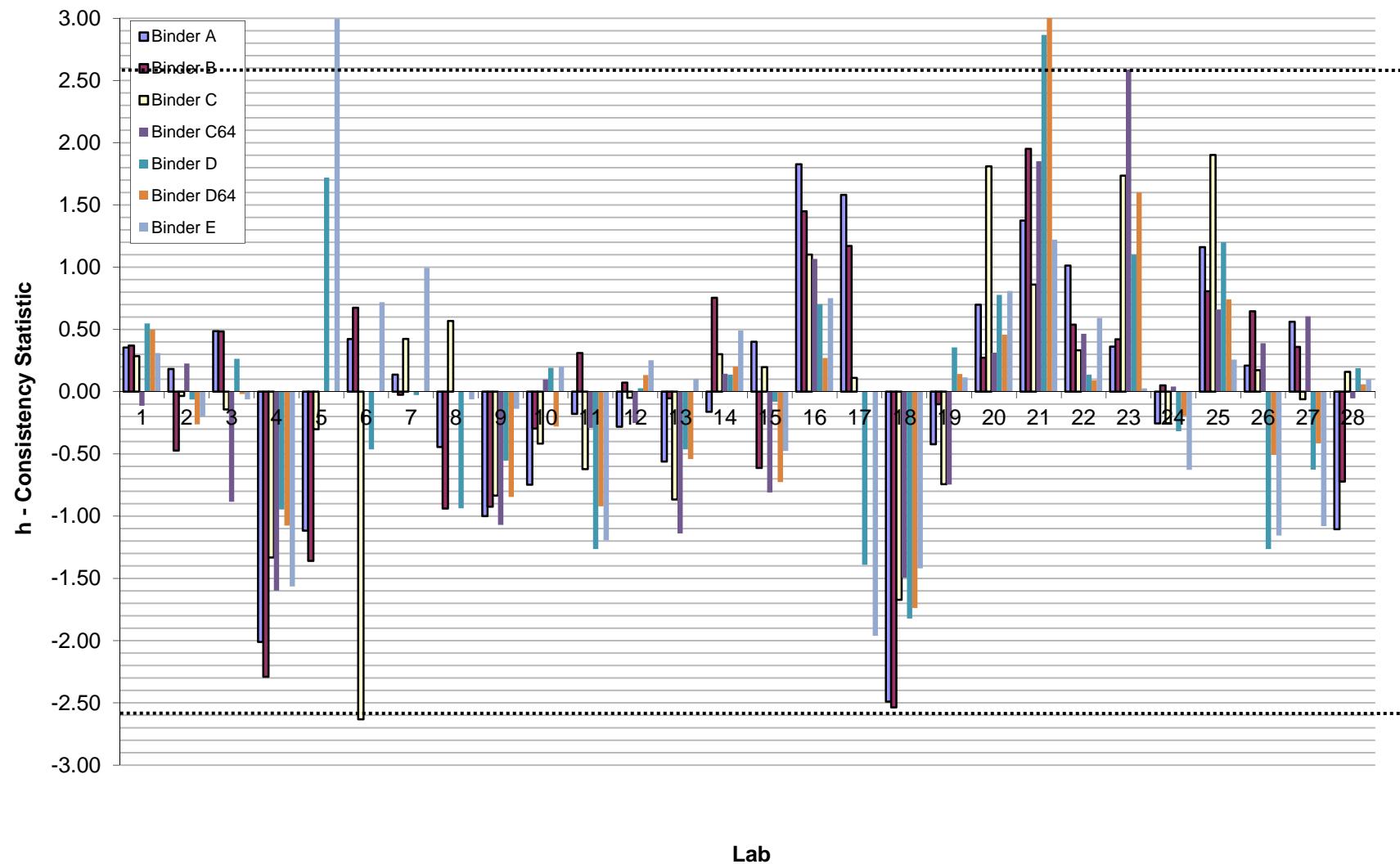
Jnr-Diff

Lab No.	Lab Name	Material						
		Binder A	Binder B	Binder C	Binder C64	Binder D	Binder D64	Binder E
1		0.22	0.24	0.04	0.37	0.01	0.45	0.22
2		0.14	0.41	0.26	0.75	0.00	0.19	0.00
3		0.38	0.20	0.42	0.41	0.04	0.30	0.10
4		1.18	0.50	0.25	0.29	0.14	0.97	0.18
5		0.26	0.59	0.02		0.00		1.06
6		2.87	0.79	0.00		5.04		2.36
7		1.66	4.45	0.50		0.09		0.74
8		0.97	0.40	0.33		0.18		1.41
9		0.56	0.20	0.30	0.59	0.03	0.53	0.26
10		0.37	0.16	0.11	0.28	0.05	0.79	0.49
11		0.36	0.35	0.12	0.77	0.55	1.74	0.93
12		0.54	0.08	0.07	0.88	0.02	0.28	0.09
13		0.15	0.37	0.11	0.22	0.05	0.41	0.22
14		0.82	0.48	0.05	0.83	0.04	0.29	0.12
15		0.82	0.20	0.21	2.86	0.09	0.74	0.56
16		0.51	0.51	0.18	1.03	0.05	1.59	0.89
17		1.57	0.12	4.83		0.33		1.21
18		1.49	1.94	0.82	2.71	0.50	0.86	0.38
19		0.11	0.15	0.54	0.13	0.06	0.16	0.12
20		0.12	0.06	0.09	0.31	0.29	1.48	0.92
21		0.30	0.18	0.58	0.26	0.06	0.18	0.11
22		0.58	0.17	0.10	0.60	0.05	0.25	0.80
23		0.67	0.38	0.85	0.98	0.18	0.55	1.34
24		1.13	0.41	0.66	0.75	0.08	0.10	0.27
25		0.69	1.02	0.21	0.18	0.54	2.13	1.38
26		0.08	0.06	0.26	0.49	0.55	2.14	1.84
27		0.13	0.43	0.15	0.42	0.26	1.03	2.43
28		2.13	0.49	0.46	0.65	0.07	0.91	0.33

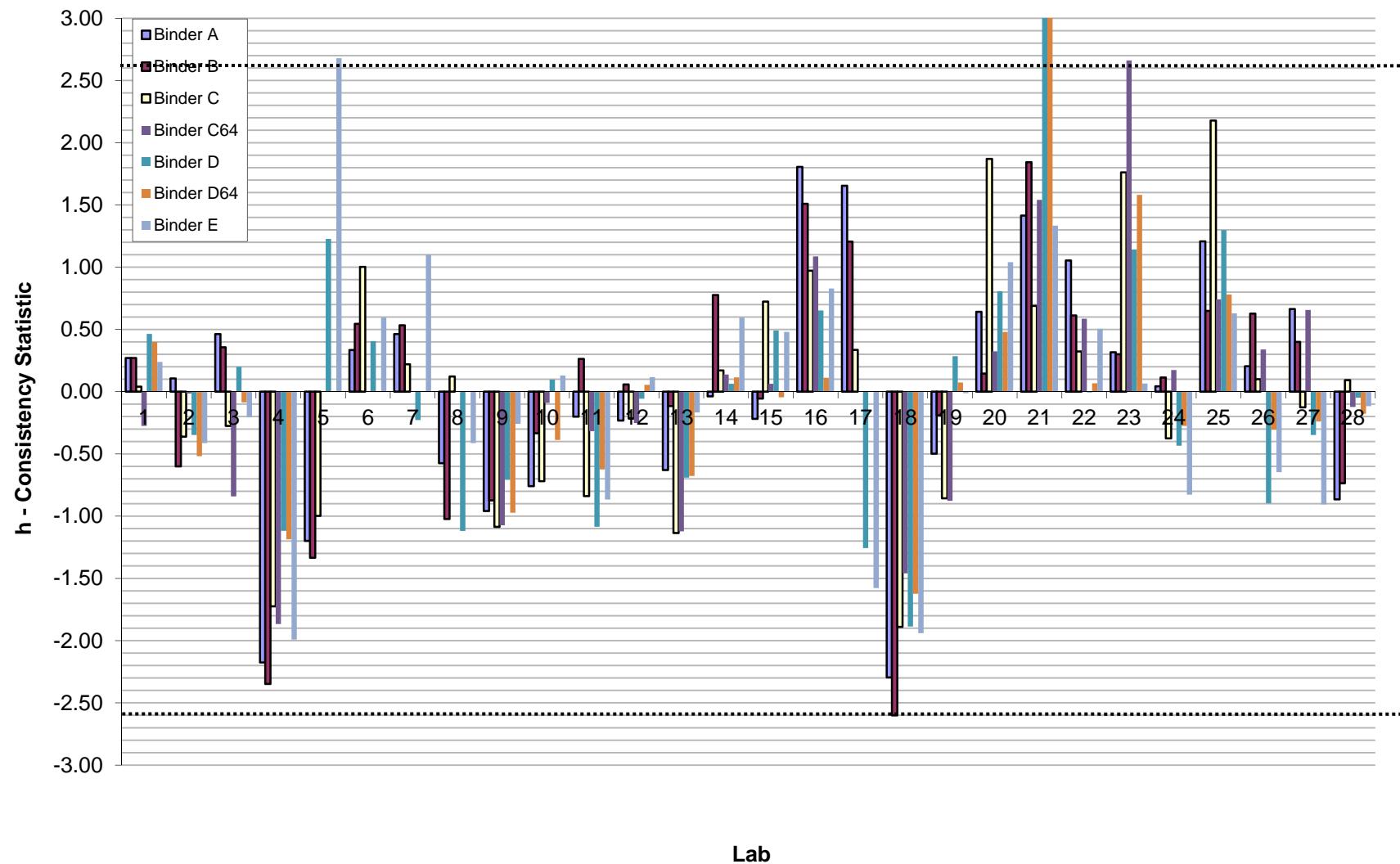
exceeds k

exceeds k-0.5

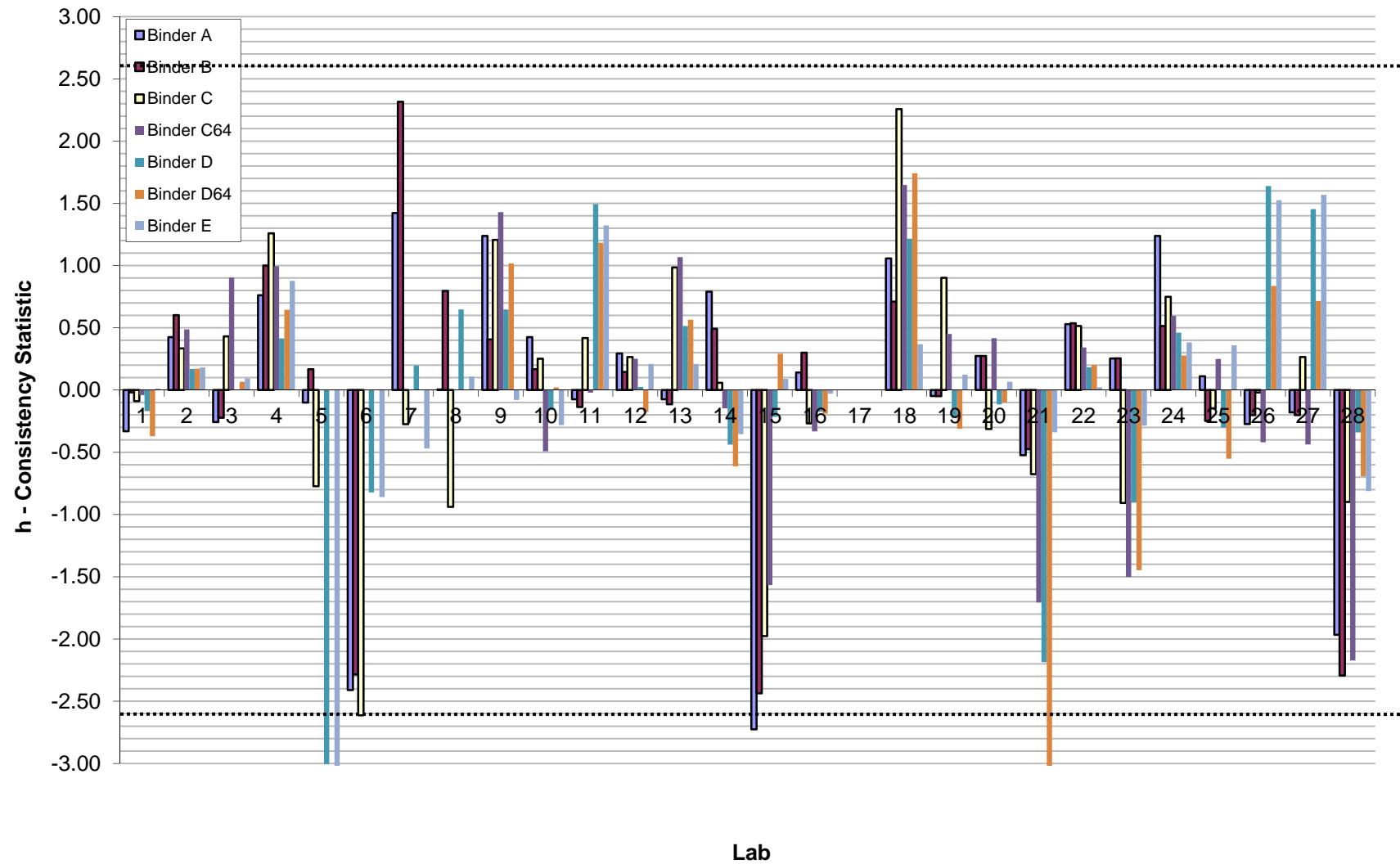
Jnr (0.1 kPa): h - Materials within Laboratories



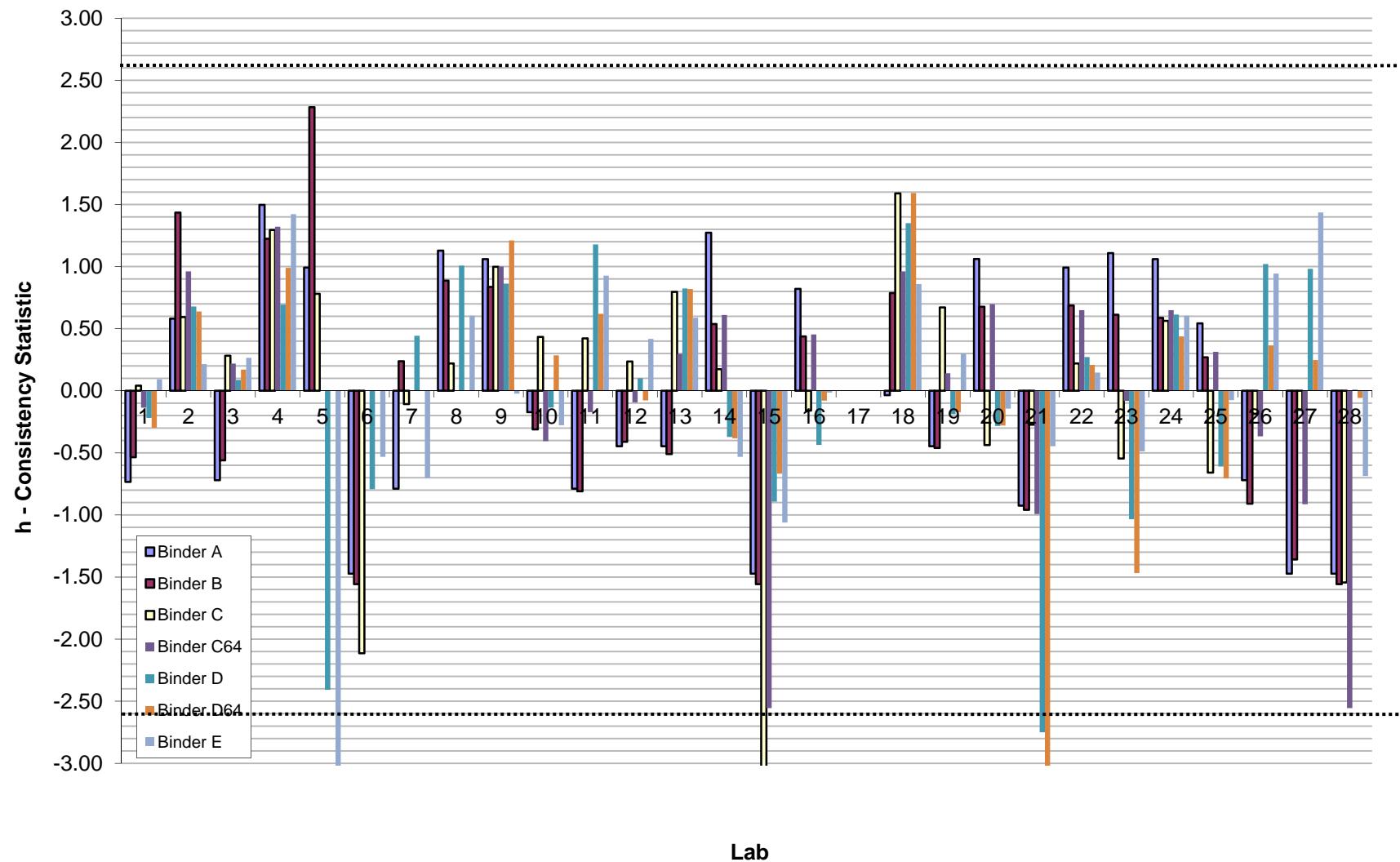
Jnr (3.2 kPa): h - Materials within Laboratories



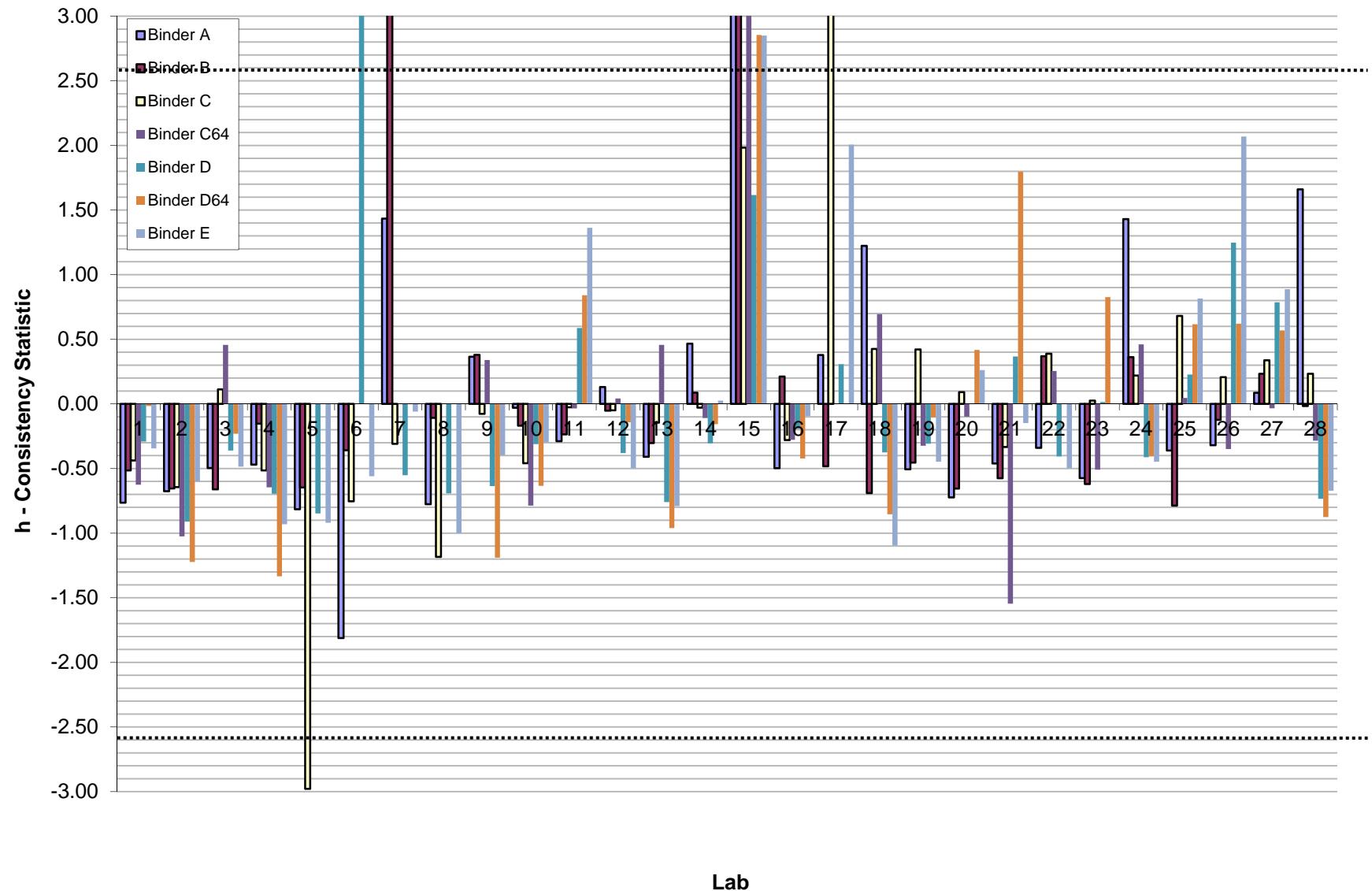
Recovery (0.1 kPa): h - Materials within Laboratories



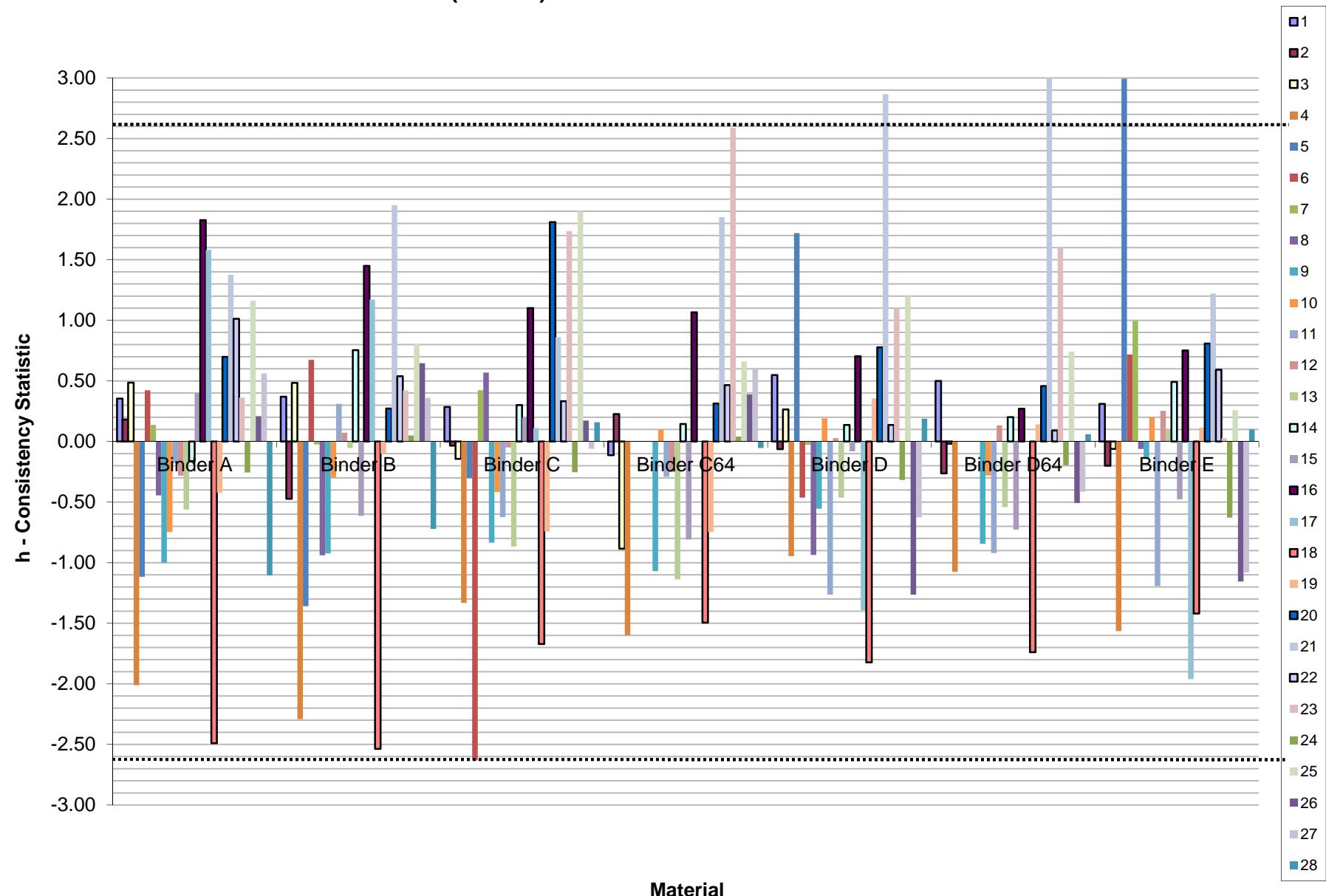
Recovery (3.2 kPa): h - Materials within Laboratories



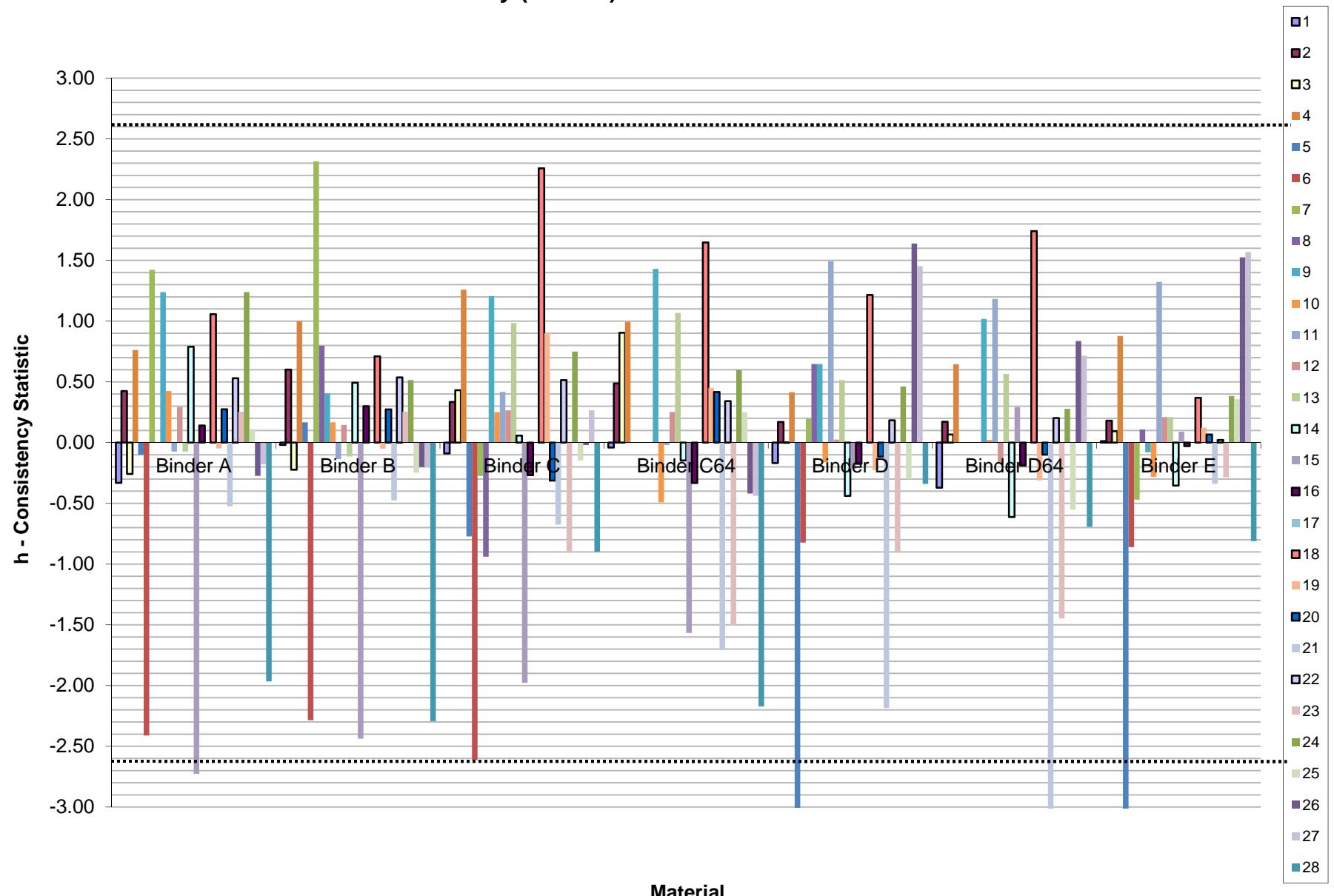
Jnr-Diff: h - Materials within Laboratories



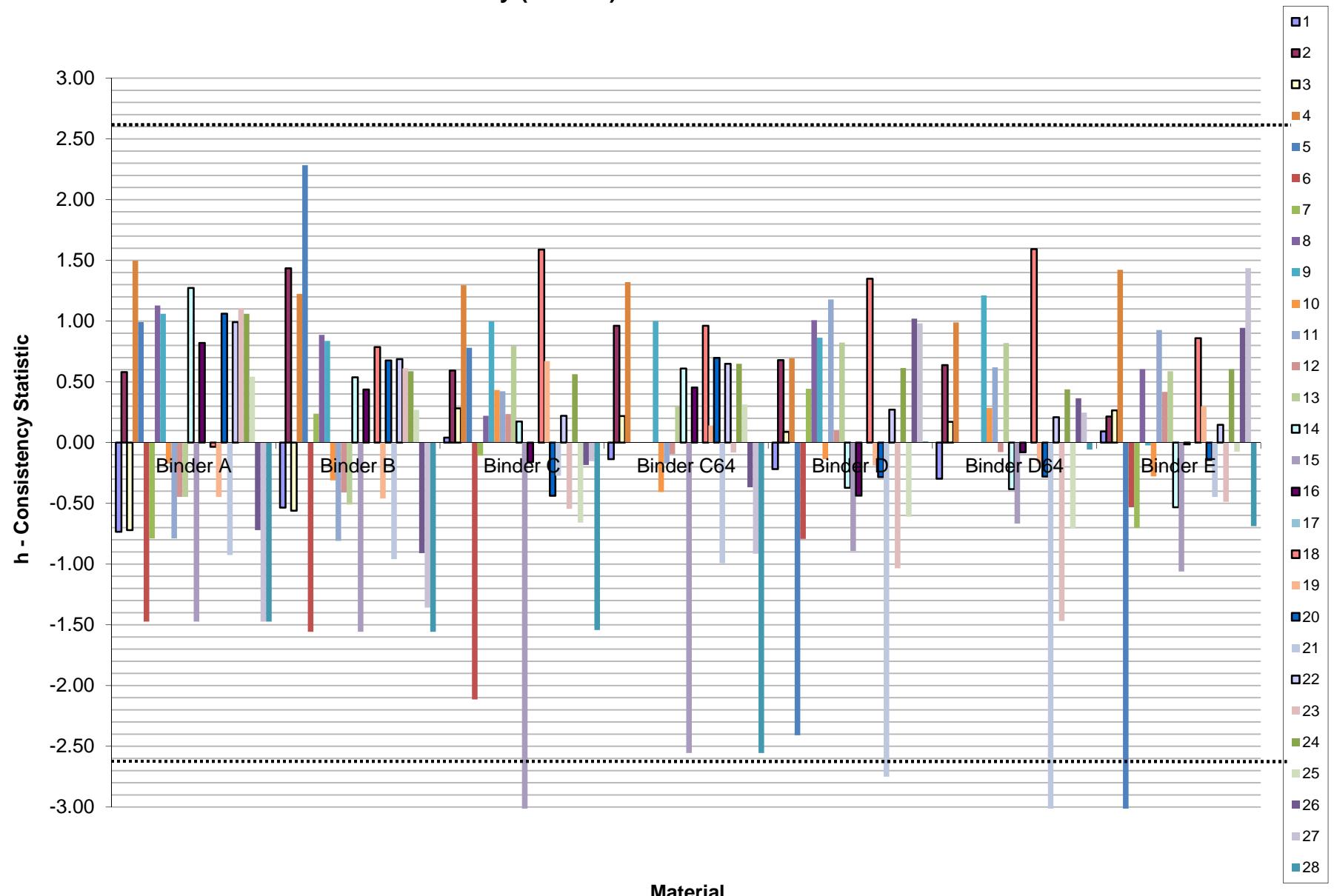
Jnr (0.1 kPa): h - Laboratories within Materials



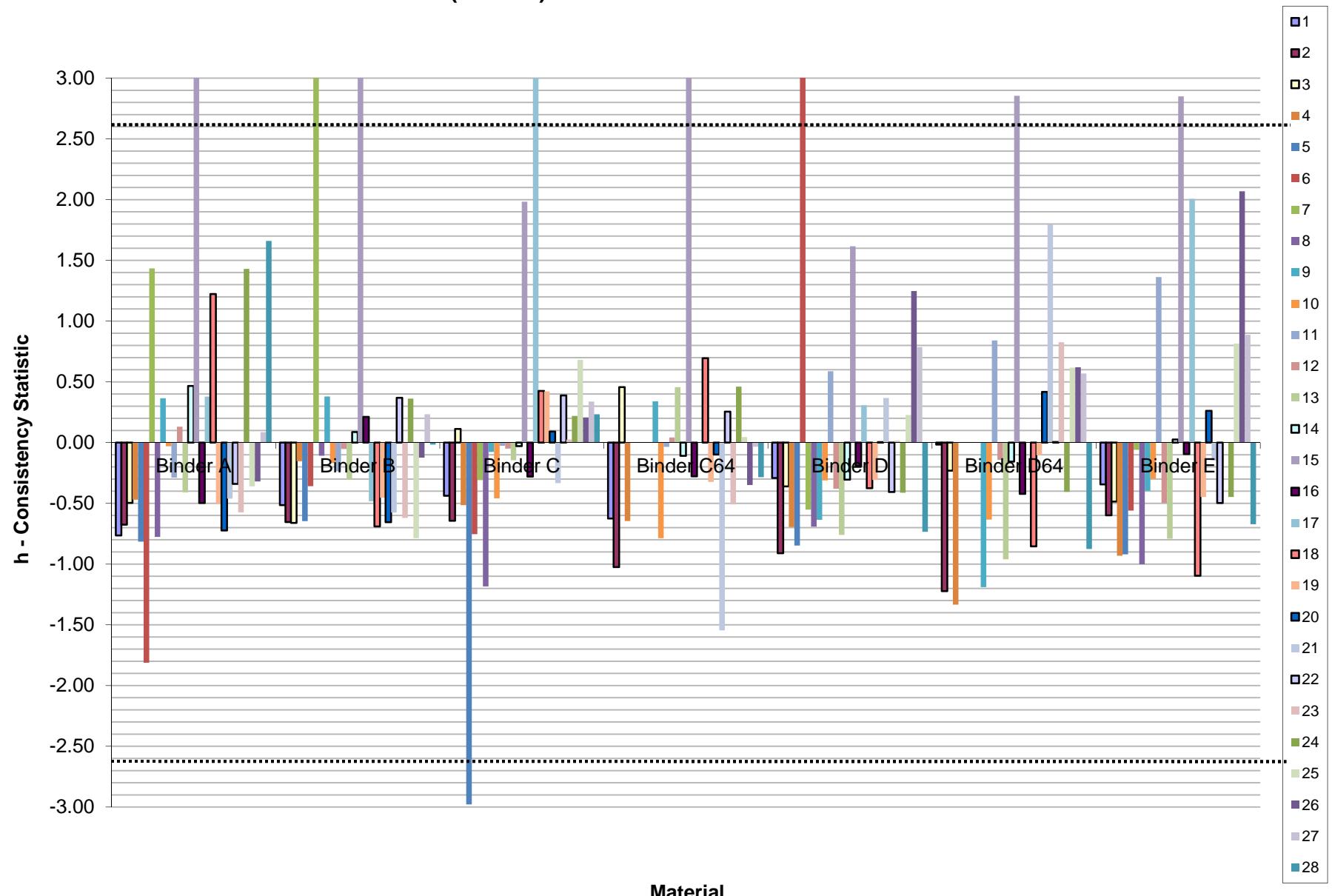
Recovery (0.1 kPa): h - Laboratories within Materials



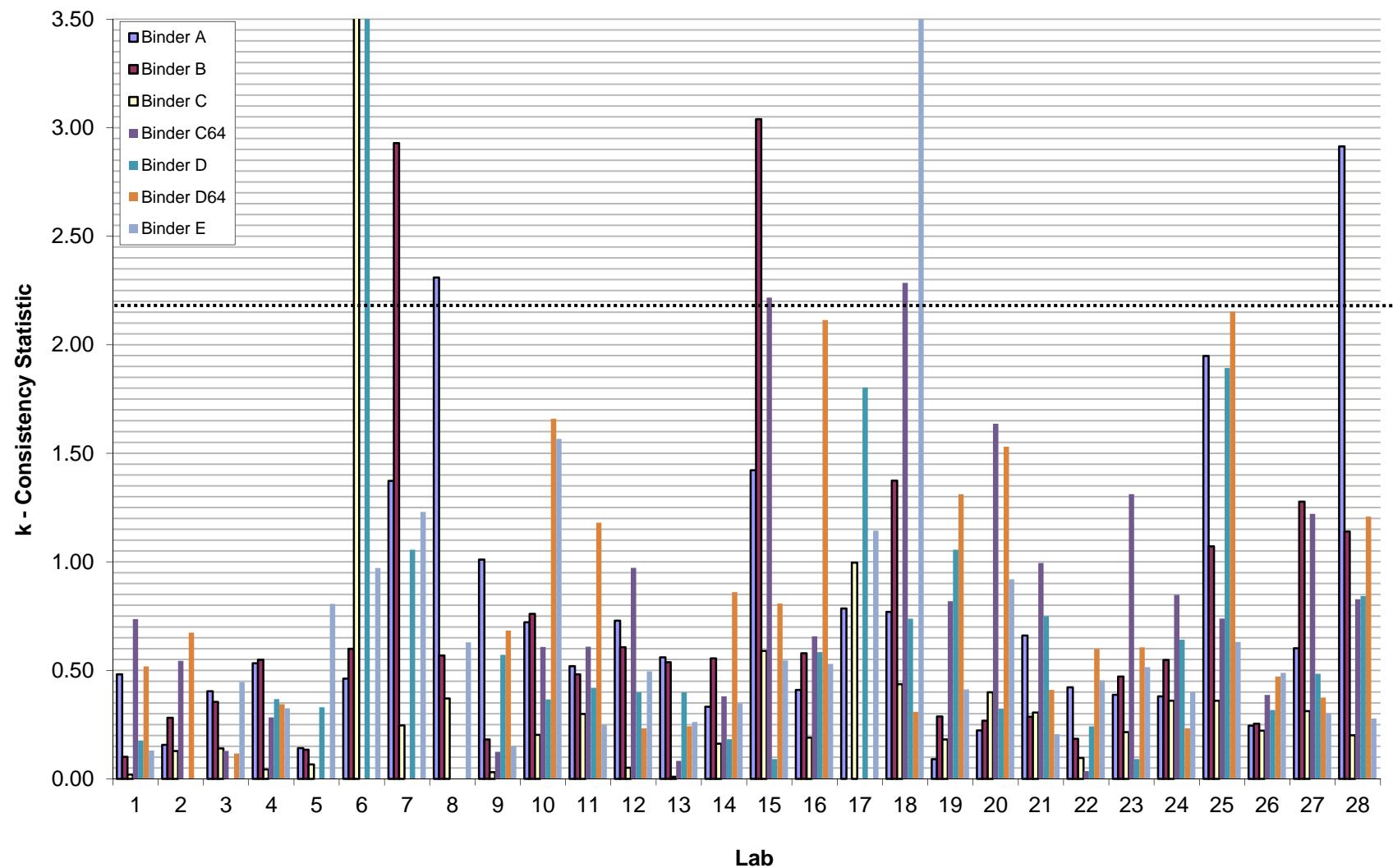
Recovery (3.2 kPa): h - Laboratories within Materials



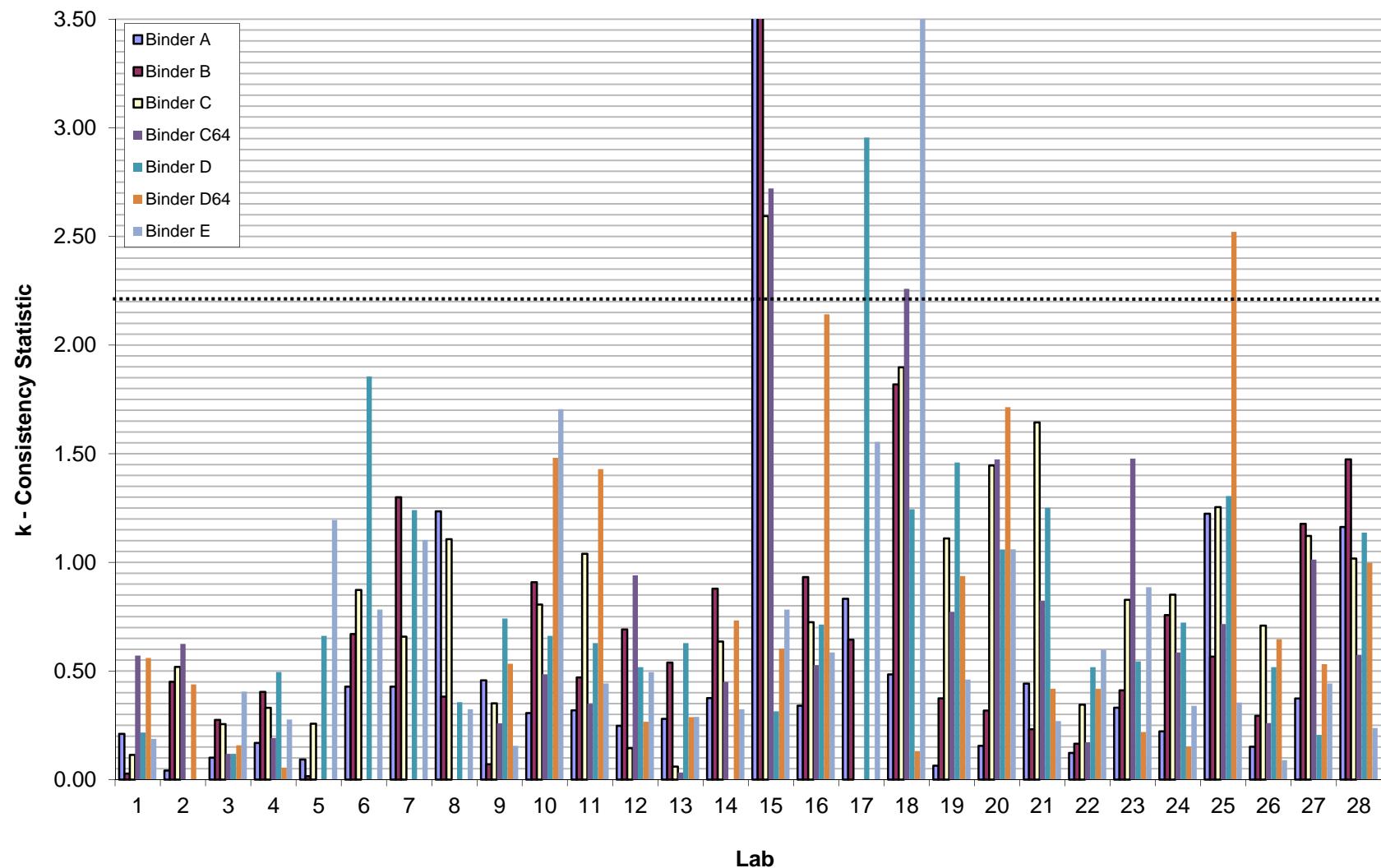
Jnr (0.1 kPa): h - Laboratories within Materials



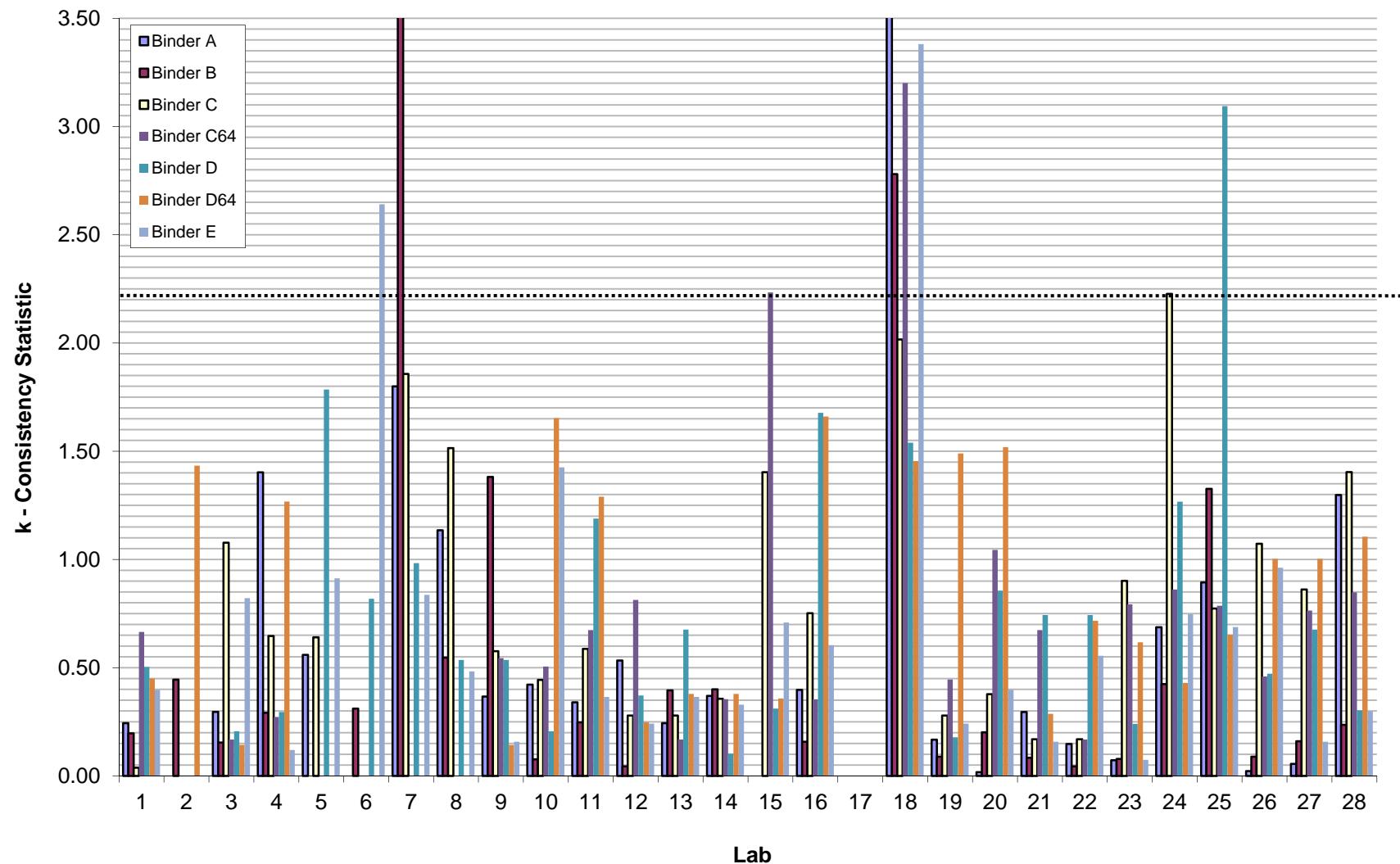
Jnr (0.1 kPa): k - Materials within Laboratories



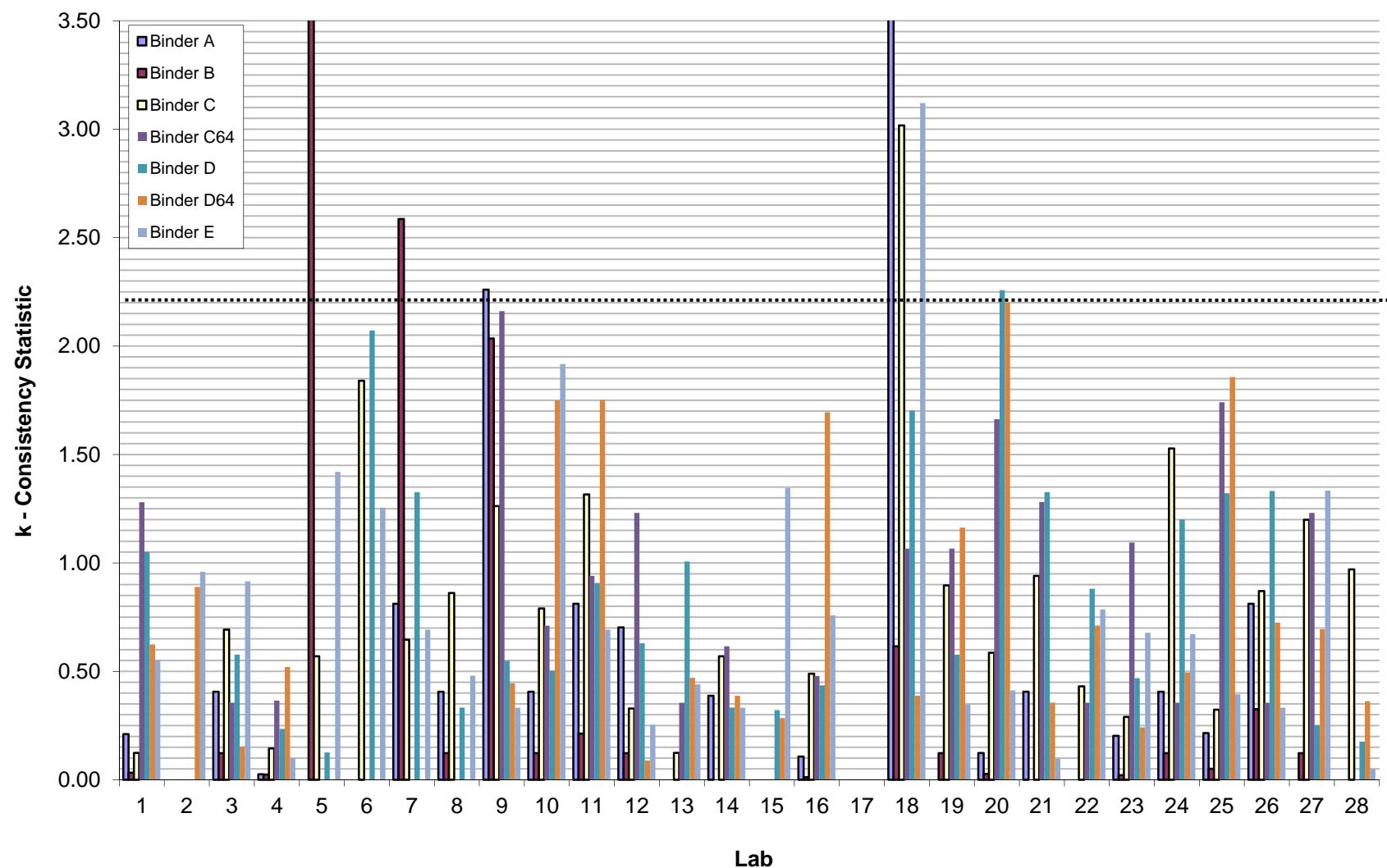
Jnr (3.2 kPa): k - Materials within Laboratories



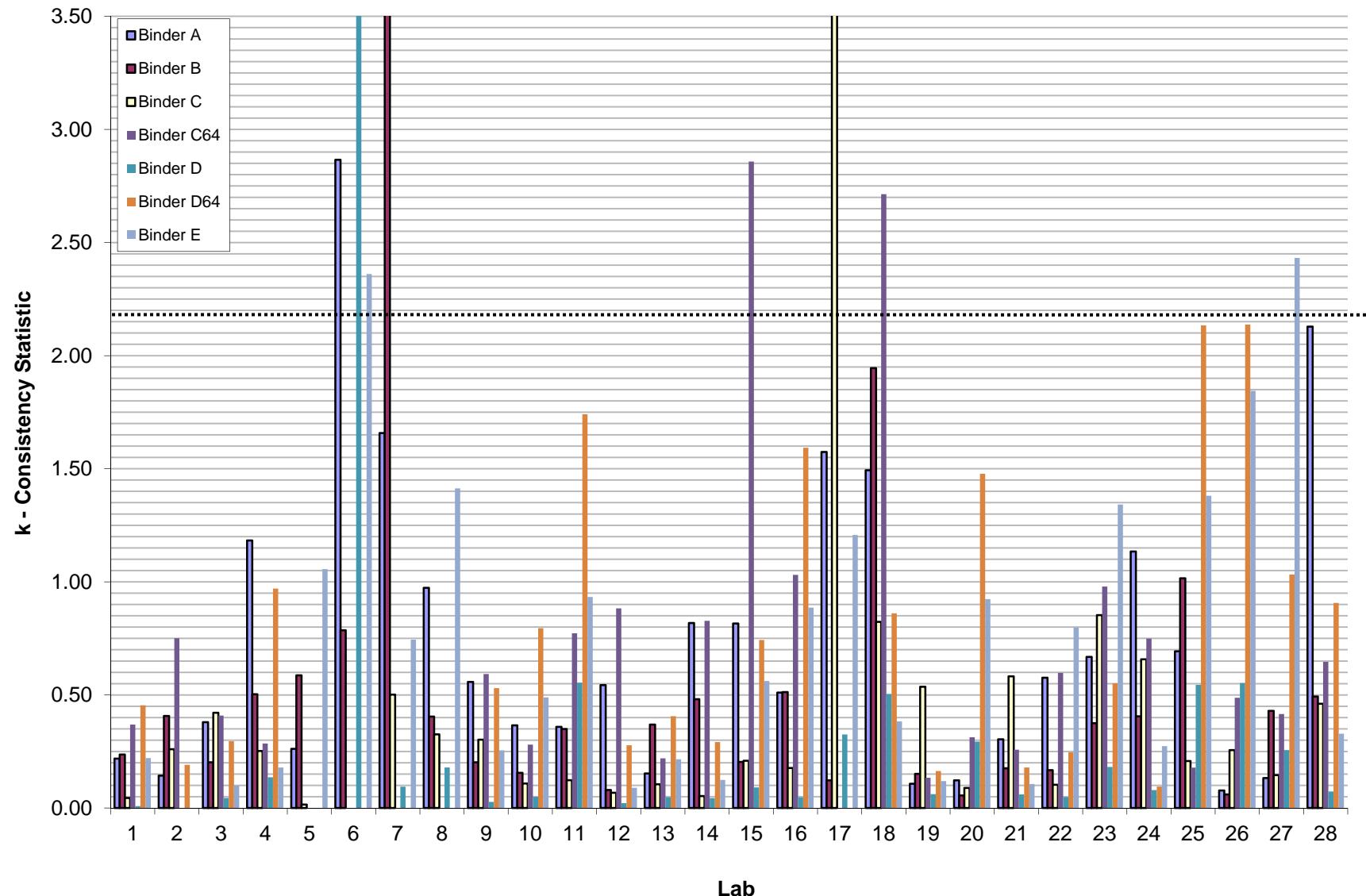
Recovery (0.1 kPa): k - Materials within Laboratories



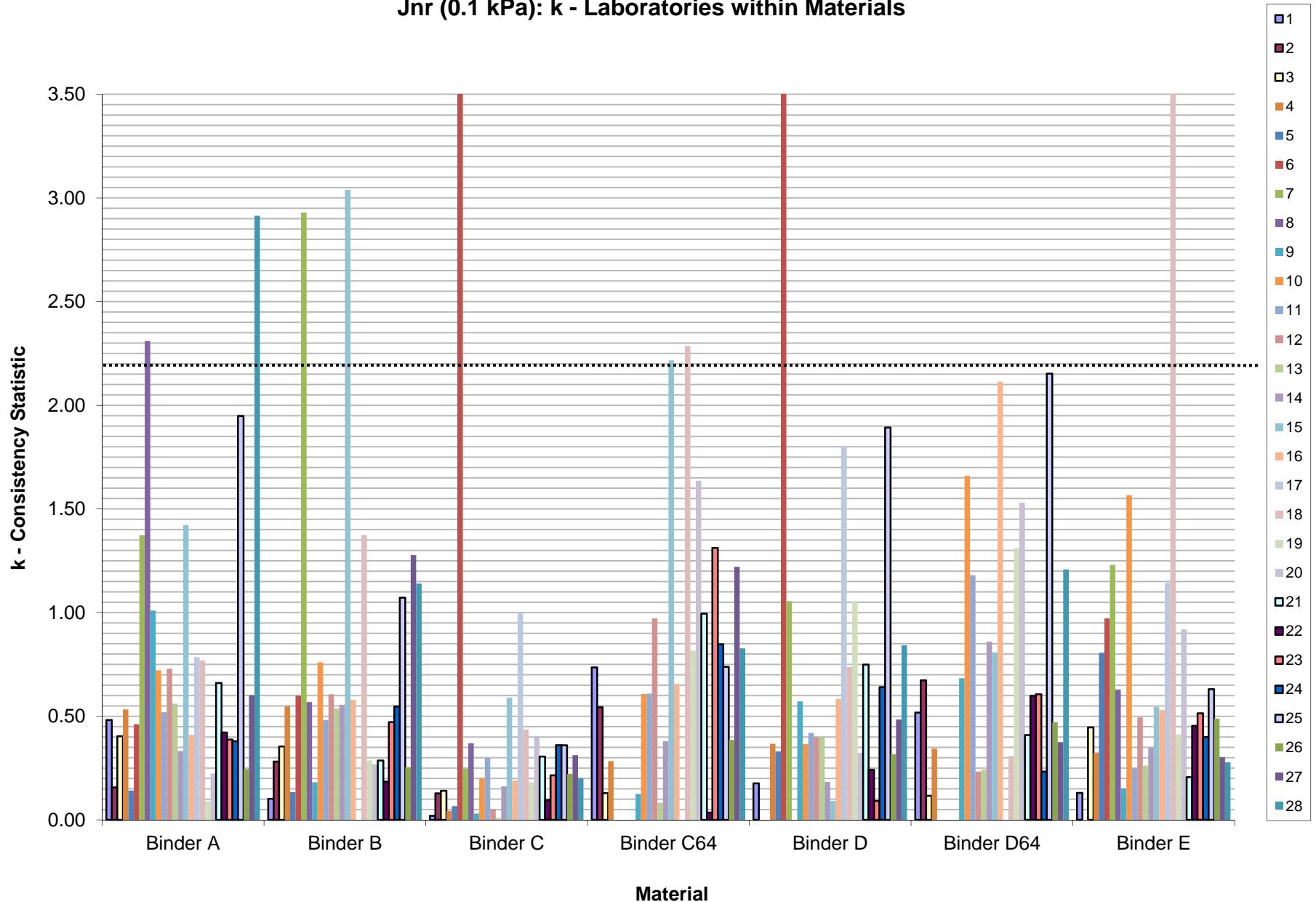
Recovery (3.2 kPa): k - Materials within Laboratories



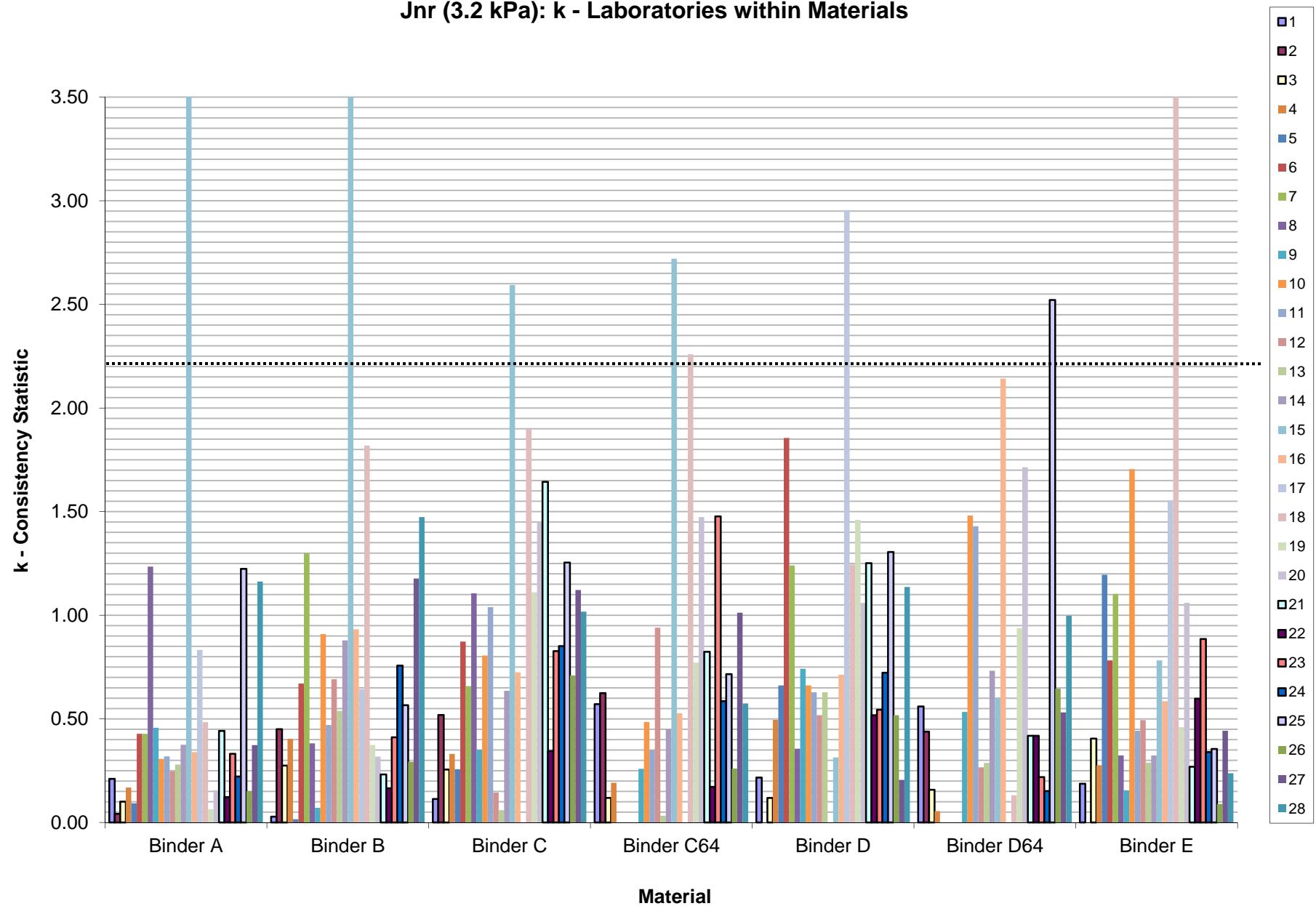
Jnr (0.1 kPa): k - Materials within Laboratories



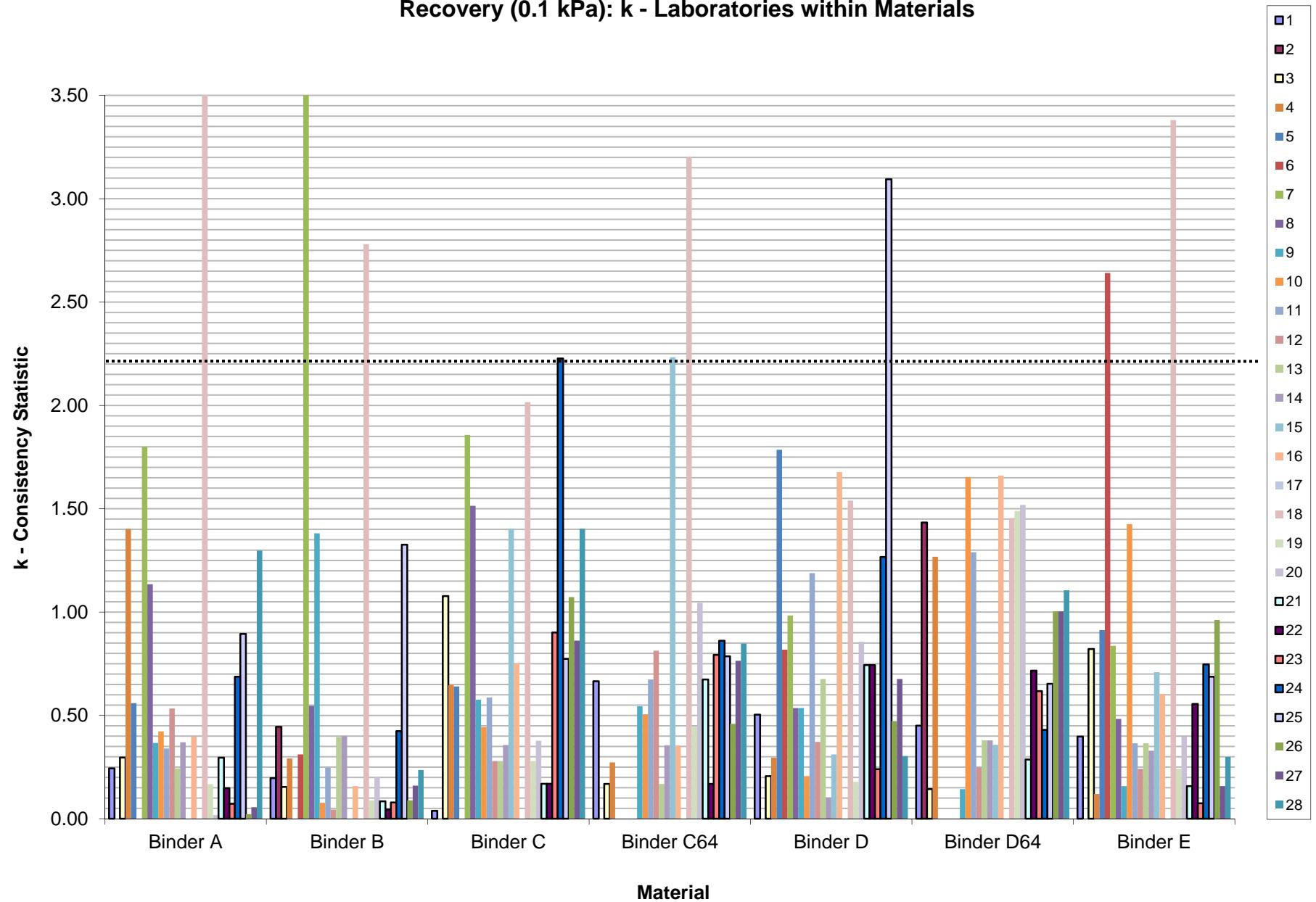
Jnr (0.1 kPa): k - Laboratories within Materials



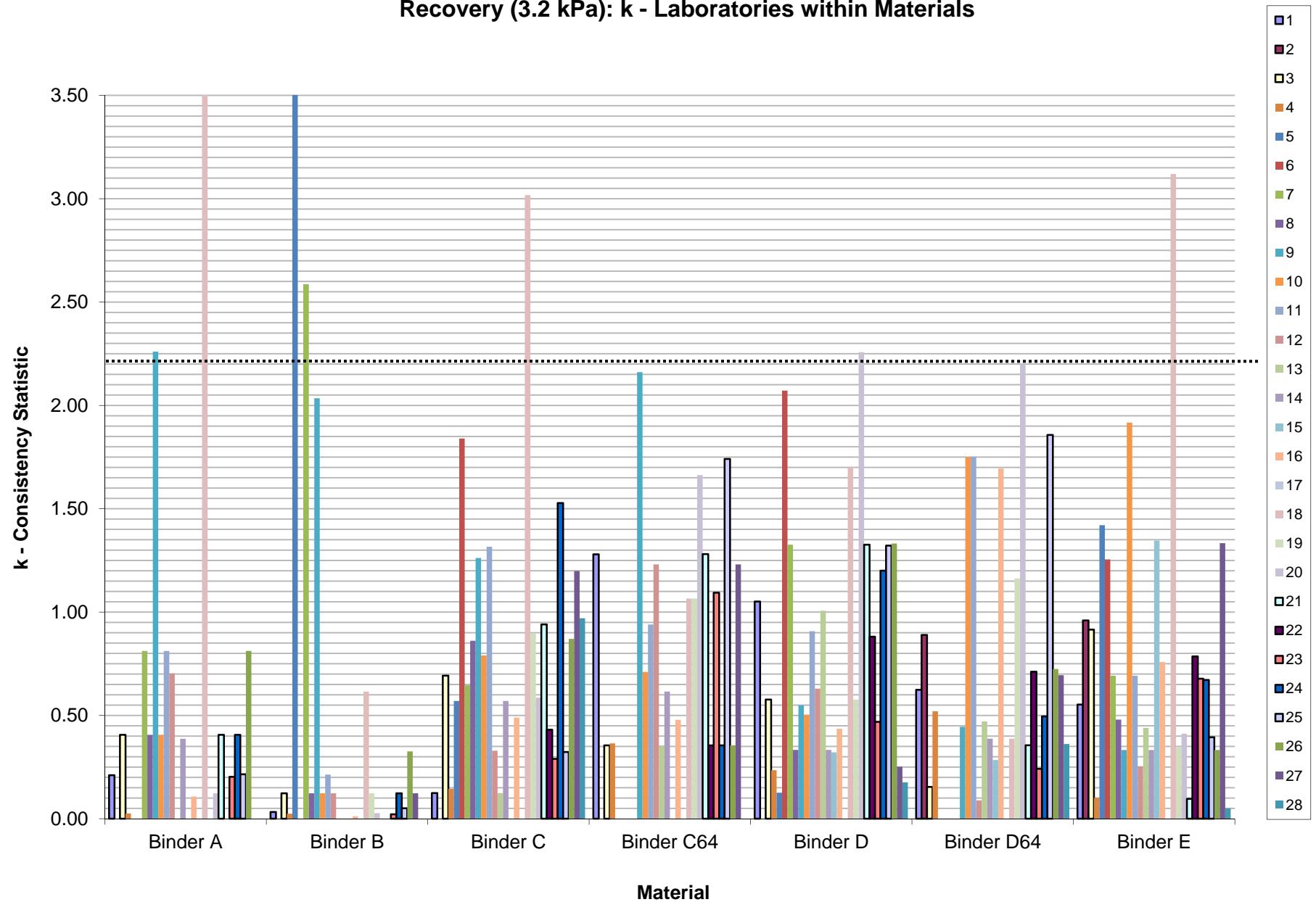
Jnr (3.2 kPa): k - Laboratories within Materials



Recovery (0.1 kPa): k - Laboratories within Materials



Recovery (3.2 kPa): k - Laboratories within Materials



Jnr (0.1 kPa): k - Laboratories within Materials

