

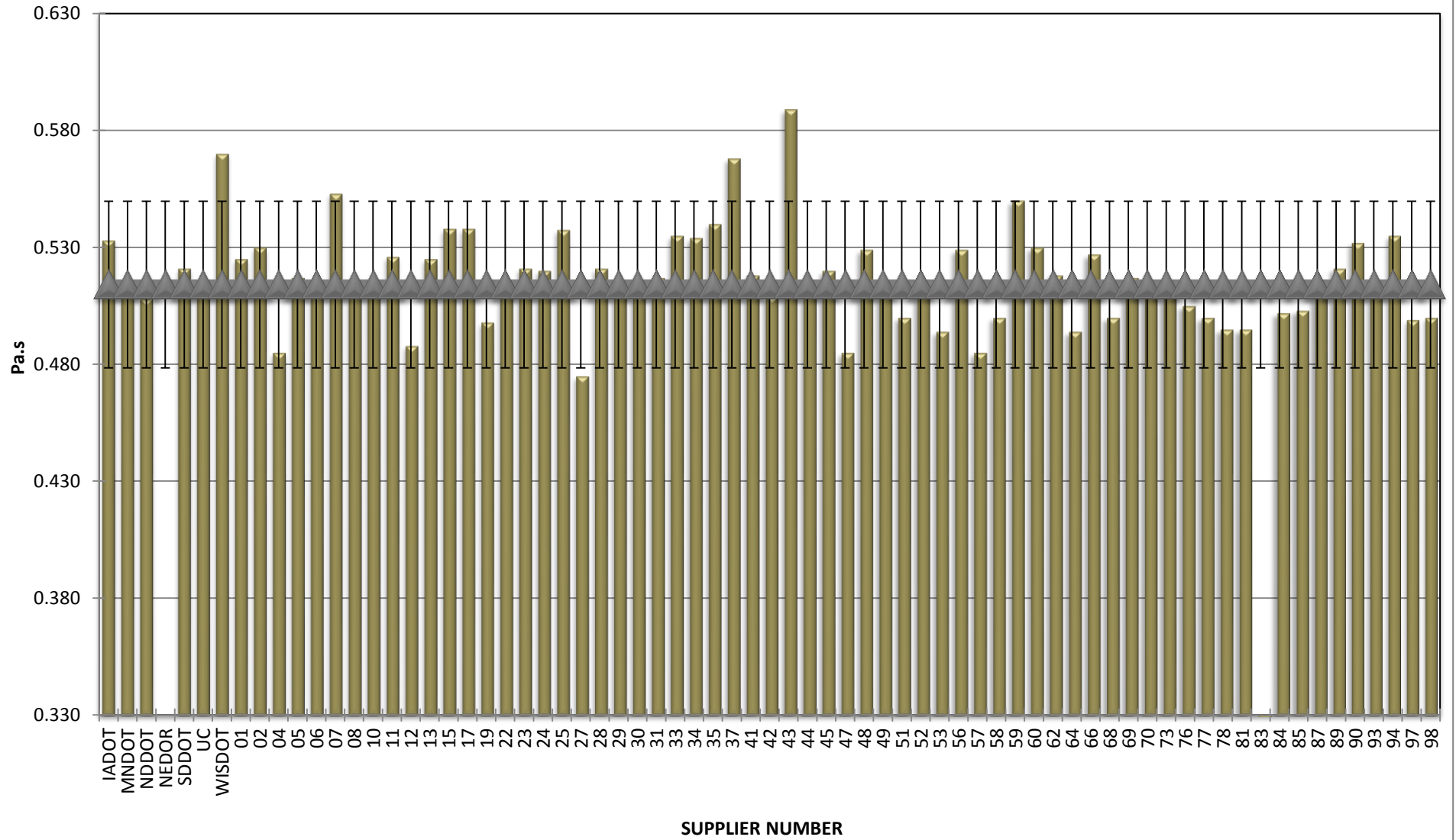
COMBINED STATE BINDER GROUP ROUND ROBIN SUMMARY A 2015-4

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Supplier Number	Rotational Viscosity (Pa.s) @135°C	DSR Original (kPa)	DSR RTFO (kPa)	DSR PAV (kPa)	Mass Loss (%) @163°C	BBR S-value (MPa)	BBR m-value	Jnr @ 100 Pa	% Recov. @ 100 Pa	Jnr @ 3200 Pa	% Recov. @ 3200 Pa
IADOT	0.533	1.37	3.260	2,640	0.708	299	0.338	1.090	49.84	1.590	31.09
MNDOT	0.512	1.35	3.710	2,790	0.685	249	0.316	0.855	53.09	1.276	34.63
NDDOT	0.508	1.38	3.530	2,705	0.825	300	0.330	0.993	49.20	1.390	33.90
NEDOR		1.35	3.570	2,406	0.853	287	0.325	0.844	55.75	1.329	35.27
SDDOT	0.521	1.39	3.250	2,710	0.557	277	0.339	1.100	48.39	1.570	32.48
UC	0.514	1.33	3.220	2,871	0.720	295	0.331	1.064	49.10	1.610	31.40
WISDOT	0.570	1.46	3.650	2,474	0.640	281	0.334	0.976	49.28	1.351	34.31
01	0.525	1.42	3.750	2,037	0.746	243	0.324	0.847	51.62	1.180	36.53
02	0.530	1.32	3.430	2,776	0.744	303	0.327	0.961	51.02	1.406	33.84
04	0.485	1.18	2.828	2,352	0.632	290	0.343				
05	0.517	1.32	3.781	2,697	0.819	295	0.323	0.844	53.60	1.330	34.29
06	0.510	1.31	3.110	2,290	1.001	245	0.332	1.192	47.04	1.703	30.29
07	0.553	1.36	3.450	2,950	0.677	275	0.340	1.050	47.95	1.460	32.44
08	0.514	1.34	3.669	2,640	0.812	300	0.324	0.863	53.80	1.329	34.64
10	0.512	1.40	3.582	2,670	0.816	290	0.326	0.910	52.33	1.390	33.38
11	0.526	1.35	3.370	2,746	0.712	307	0.326	1.002	50.67	1.485	32.45
12	0.488	1.32	3.280	2,770	0.774	300	0.334				
13	0.525	1.30	3.420	2,910	0.788	265	0.324	0.872	52.89		34.88
15	0.538	1.32	3.550	1,881	0.928	286	0.330	0.905	52.66		33.93
17	0.538	1.38	3.710	2,178	0.749	247	0.326	0.905	50.30	1.260	35.42
19	0.498	1.35	3.700	2,681	0.794		0.331	0.837	54.00	1.243	35.80
22	0.515	1.30	3.425	2,693	0.820	297	0.324	0.933	52.05	1.457	32.71
23	0.521	1.38	3.490	2,530	0.787	282	0.346	0.893	52.90	1.320	34.77
24	0.520	1.33	3.310	2,400	0.672	268	0.335	1.004	51.81		32.60
25	0.538	1.36	3.455	4,059	0.642	270	0.325	0.960	51.61		33.11
27	0.475	1.34	3.230	2,510	0.742	243	0.358	1.029	51.42	1.573	31.56
28	0.521	1.37	3.220	2,581	0.646	273	0.329	1.115	47.59	1.554	32.45
29	0.515	1.33	3.230	2,555	0.834	287	0.333	1.110	48.23	1.550	32.72
30	0.510	1.41	3.320	2,216	0.517	270	0.345	1.240	44.43	1.620	30.91
31	0.517	1.44	3.504	2,691	0.815	299	0.325	0.892	53.36	1.402	33.91
33	0.535	1.30	3.280	2,620	0.620	294	0.337	1.072	48.71	1.516	32.41
34	0.534	1.38	3.430	2,919	0.733	302	0.322	0.994	49.66	1.398	34.15
35	0.540	1.34	4,390	2,550	0.848	287	0.340				
37	0.568	1.35	3.310	3,121	0.789	281	0.328	1.090	48.18	1.520	32.51
41	0.518	1.32	3.702	2,800	0.804	299	0.326	0.863	53.99	1.388	34.05
42	0.509	1.33	3.220		0.928			1.060	50.57	1.590	31.14
43	0.589	1.36	3.270	2,890	0.668	266	0.341	1.040	48.19	1.460	32.48
44	0.516	1.40	3.384	2,780	0.824	296	0.322	0.931	52.87	1.471	33.17
45	0.520	1.39	3.850	2,509	0.774	248	0.322	0.825	51.74	1.150	37.28
47	0.485	1.22	3.082	2,423	0.753	289	0.340				
48	0.529	1.37	3.500	2,733	0.725	293	0.329	1.000	48.74	1.384	33.96
49	0.516	1.35	3.270	2,670	0.751	276	0.341	1.031	50.82	1.548	31.58
51	0.500	1.33	3.320	2,742	0.675		0.330	0.996	51.40	1.480	32.60
52	0.513	1.33	3.254	2,690	0.793	306	0.329	0.988	52.14	1.569	31.95
53	0.494	1.34	3.110	2,570	0.751	287	0.330	1.160	47.75	1.660	30.77
56	0.529	1.32	3.640	3,060	0.665	301	0.321	0.863	53.61	1.294	35.01
57	0.485	1.21	2,915	2,225	0.668	294	0.338				
58	0.500	1.34	3.570	2,860	0.700	288	0.328	0.901	52.68	1.340	34.27
59	0.550	1.37	3.440	2,984	0.642	283	0.339	1.010	50.30		33.70
60	0.530	1.29	3.150	2,040	0.791	291	0.327	1.004	48.72	1.392	33.63
62	0.518	1.32	3.410	2,900	0.683	300	0.327	0.958	52.03	1.441	33.02
64	0.494	1.34	3.070	2,670	0.759	287	0.326	1.202	46.73	1.690	30.34
66	0.527	1.31	3.320	2,849	0.624	269	0.327	1.013	50.80	1.437	34.96
68	0.500	1.32	3.300	2,844	0.778	284	0.328	1.050	49.22	1.480	32.86
69	0.517	1.34	3.200	2,877	0.731	294	0.325	1.041	50.00	1.560	32.50
70	0.515	1.36	3.557	2,640	0.721	265	0.351	1.048	48.35	1.468	32.77
73	0.512	1.34	3.500	2,590	0.758	298	0.342	0.949	52.37	1.410	33.90
76	0.505	1.32	3.090	2,160	0.340	263	0.341	1.060	51.74	1.620	31.94
77	0.500	1.29	3.500	2,330	0.824	259	0.352	0.908	52.37	1.350	34.18
78	0.495	1.31	3.570	2,780	0.704	294	0.328	0.913	52.96	1.370	34.42
81	0.495	1.30	3.580	2,900	0.711	290	0.329	0.907	52.66	1.360	34.00
83	0.269	1.36	3.462	2,809	0.728	293	0.317	1.008	49.40	1.414	33.90
84	0.502	1.32	3.550	2,613	0.940	306	0.338	0.089	53.47	1.376	33.81
85	0.503	1.33	3.230	2,320	0.325	268	0.341	1.020	51.57	1.530	32.47
87	0.514	1.32	3.575	2,546	0.815	296	0.330	0.880	52.71	1.322	34.28
89	0.521	1.34	3.570	2,431	0.945	283	0.330	0.904	52.57		33.54
90	0.532	1.36	3.570	2,903	0.639	272	0.325	0.963	49.51	1.321	35.54
93	0.515	1.35	3.510	2,570	0.743	290	0.340	0.929	52.30	1.380	33.90
94	0.535	1.37	3.960	2,630	0.878	224	0.356	0.739	56.44		38.77
97	0.499	1.33	3.410	2,748	0.784		0.336	0.943	52.40	1.410	33.70
98	0.500	1.32	3.350	2,326	0.676		0.339	0.971	52.00	1.444	33.30
99	0.523	1.33	3.440	2,680	0.661	256	0.332	1.113	44.35	1.469	32.50
Average	0.514	1.34	3.428	2,644	0.738	282	0.332	0.966	50.92	1.440	33.45
Std. Dev.	0.036	0.04	0.243	303	0.113	18	0.009	0.147	2.40	0.121	1.56
Coef. of Var.	6.934	3.31	7.074	11	15.350	7	2.640	15.255	4.72	8.413	4.68

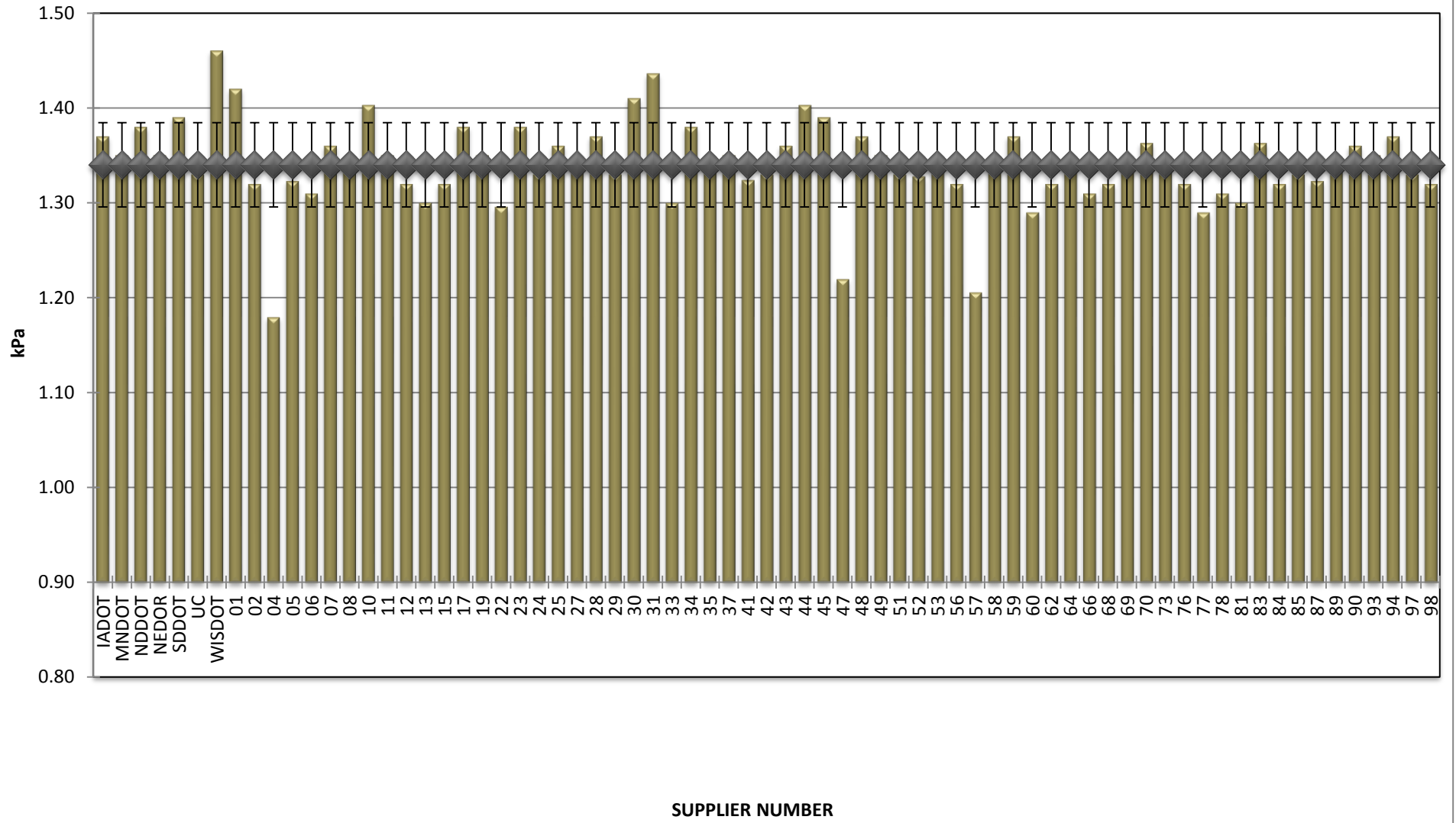
COMBINED STATE BINDER GROUP ROUND ROBIN
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ROTATIONAL VISCOSITY



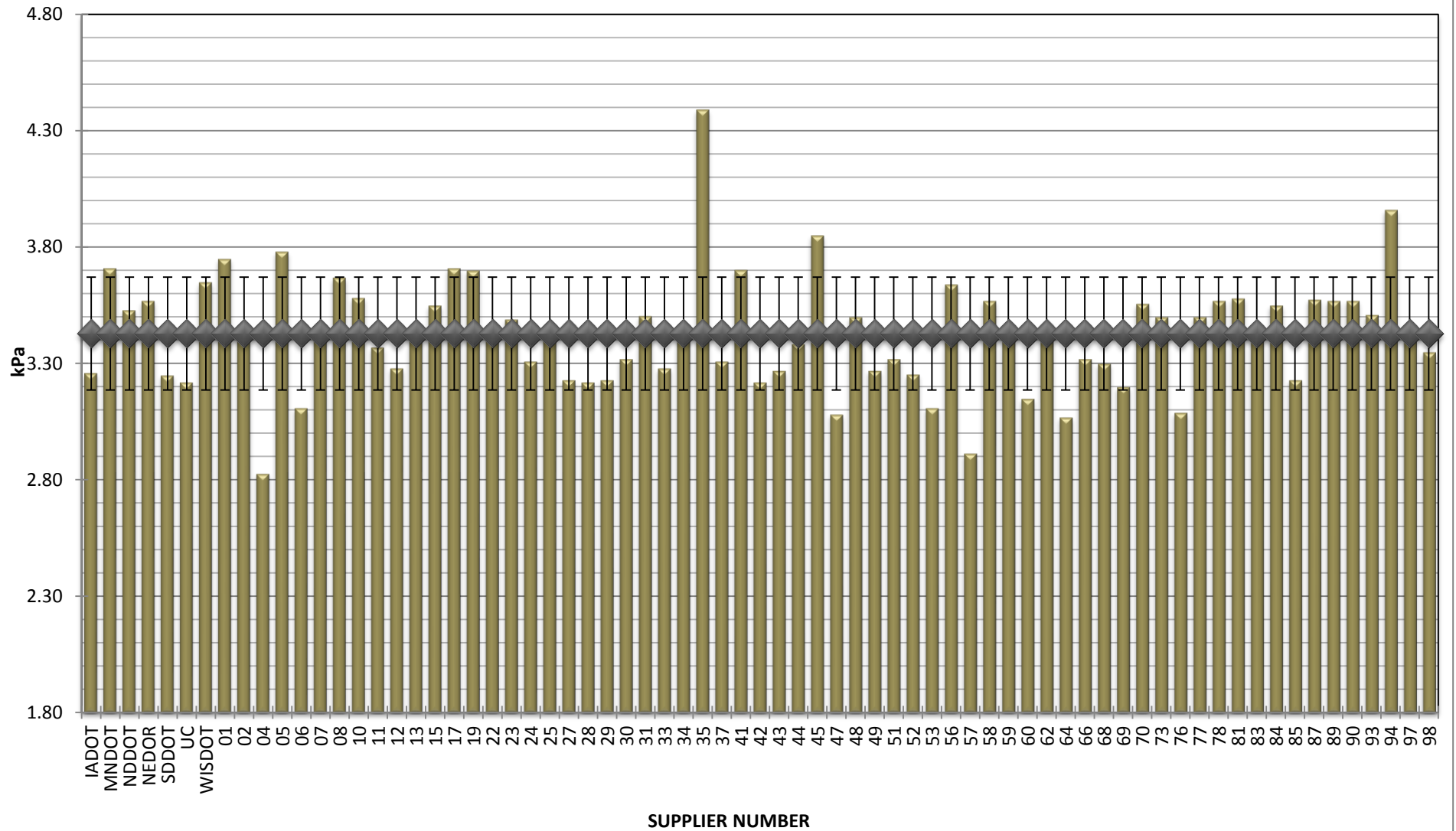
**COMBINED STATE BINDER GROUP ROUND ROBIN
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DSR - ORIGINAL



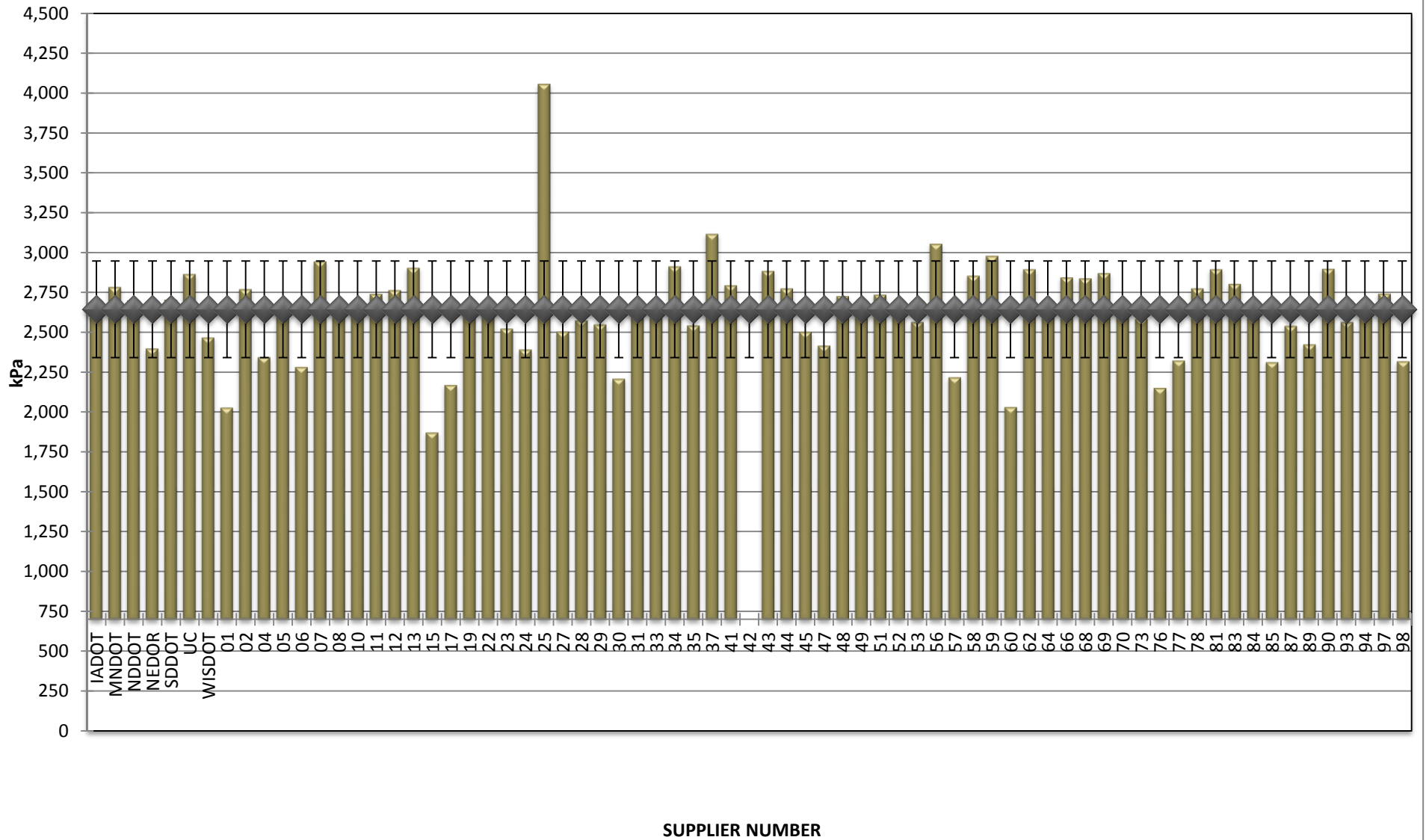
**COMBINED STATE BINDER GROUP ROUND ROBIN
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DSR - RTFO



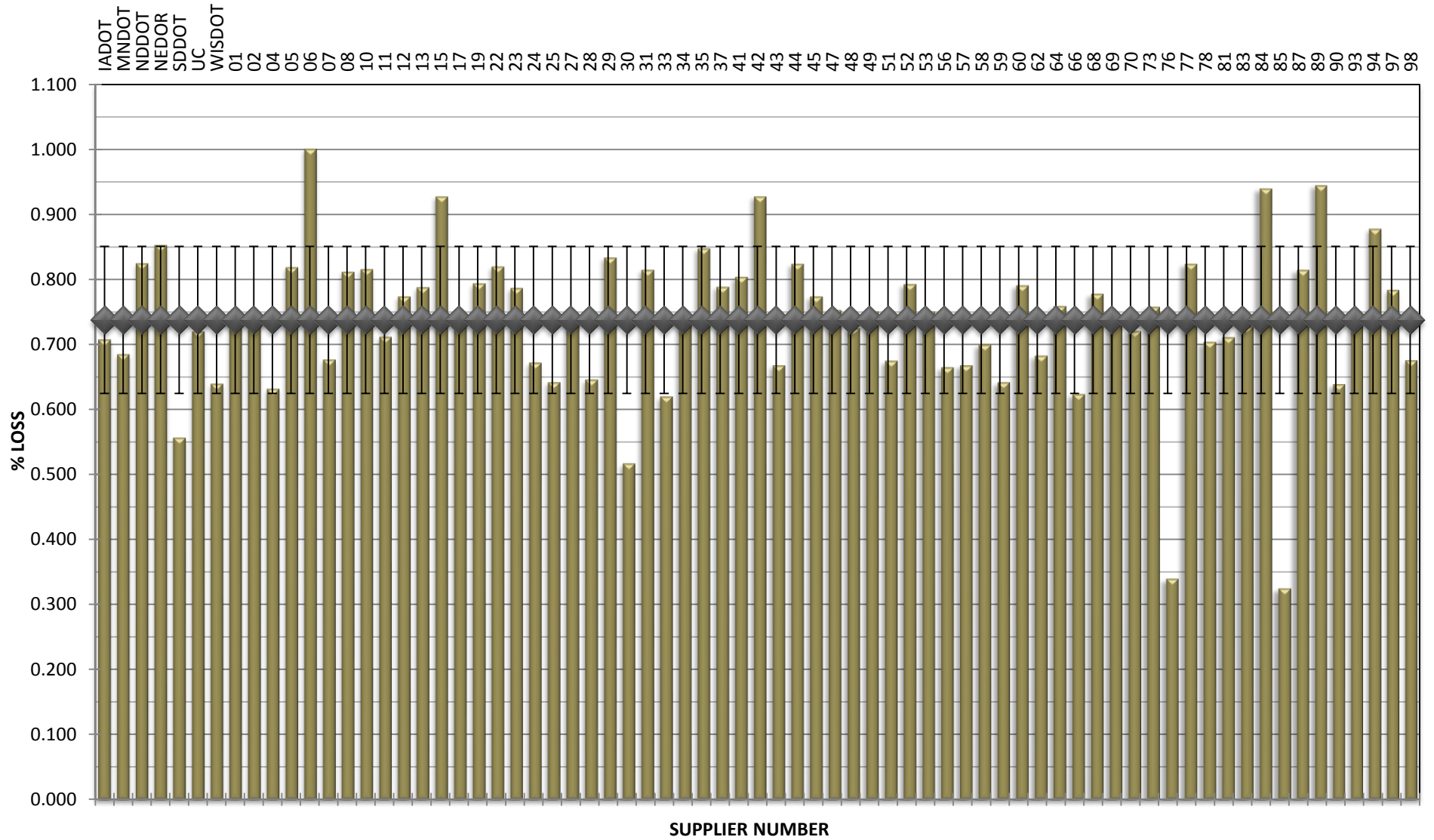
**COMBINED STATE BINDER GROUP ROUND ROBIN
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DSR - PAV



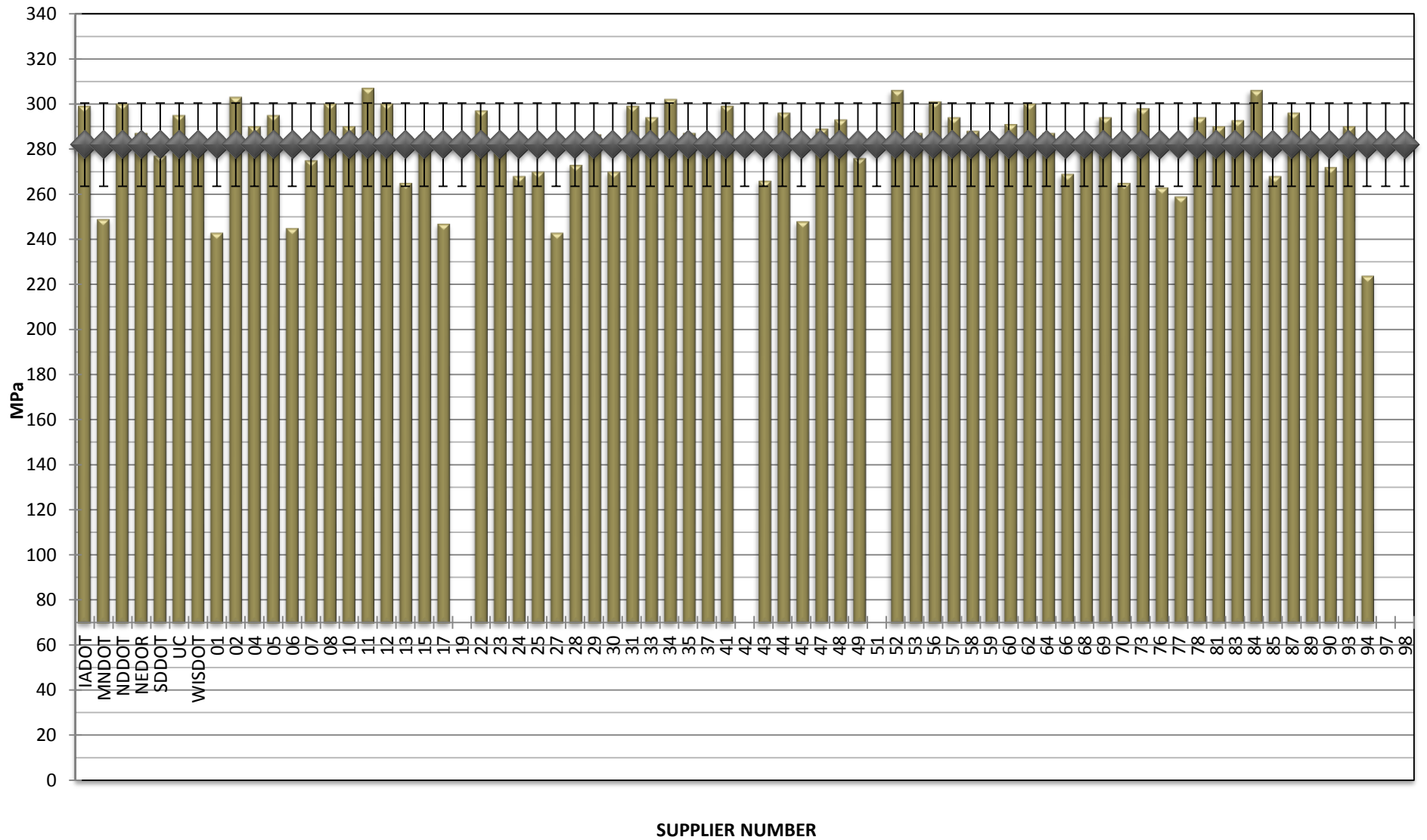
**COMBINED STATE BINDER GROUP ROUND ROBIN
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RTFO MASS LOSS



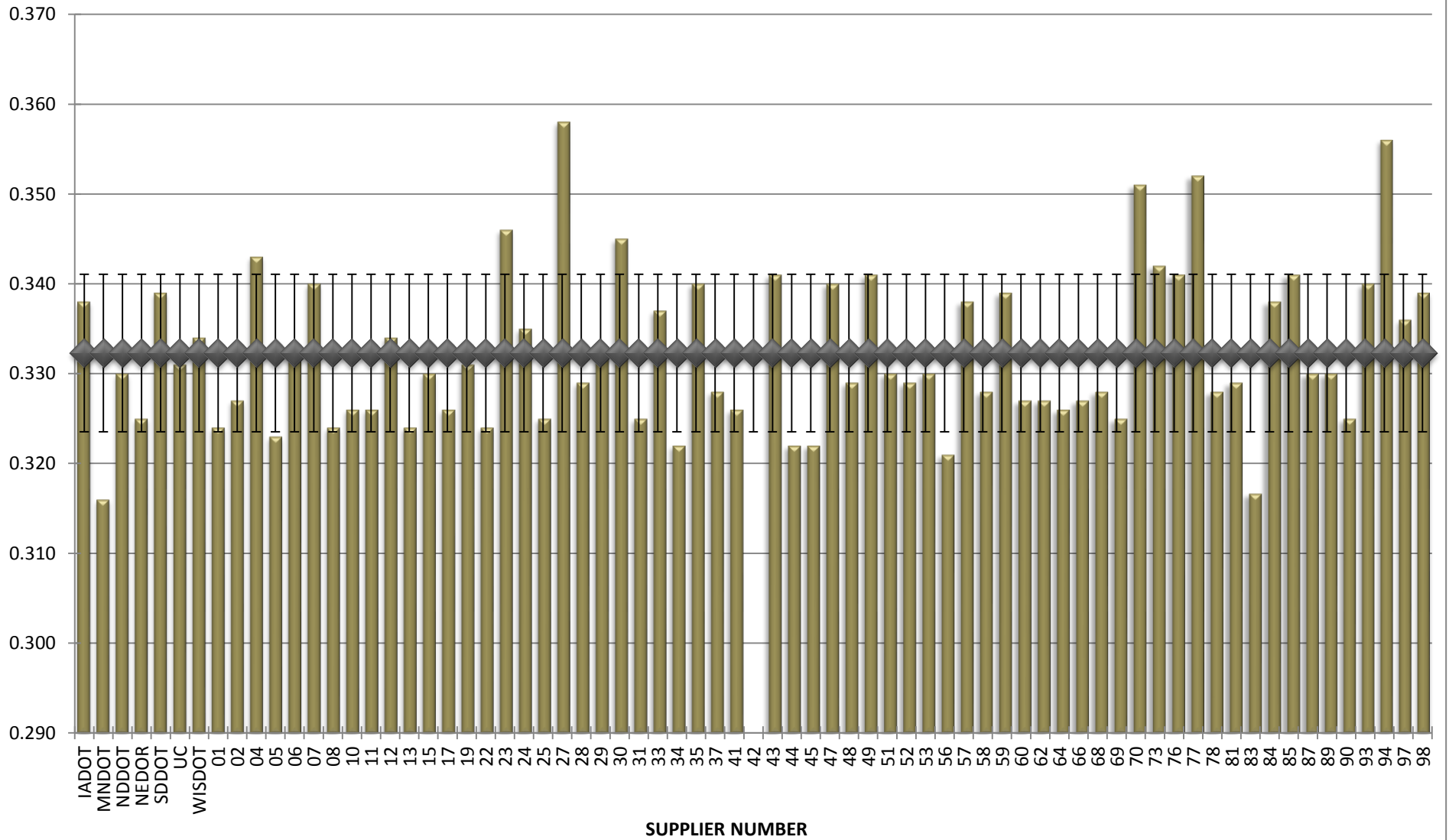
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BBR STIFFNESS



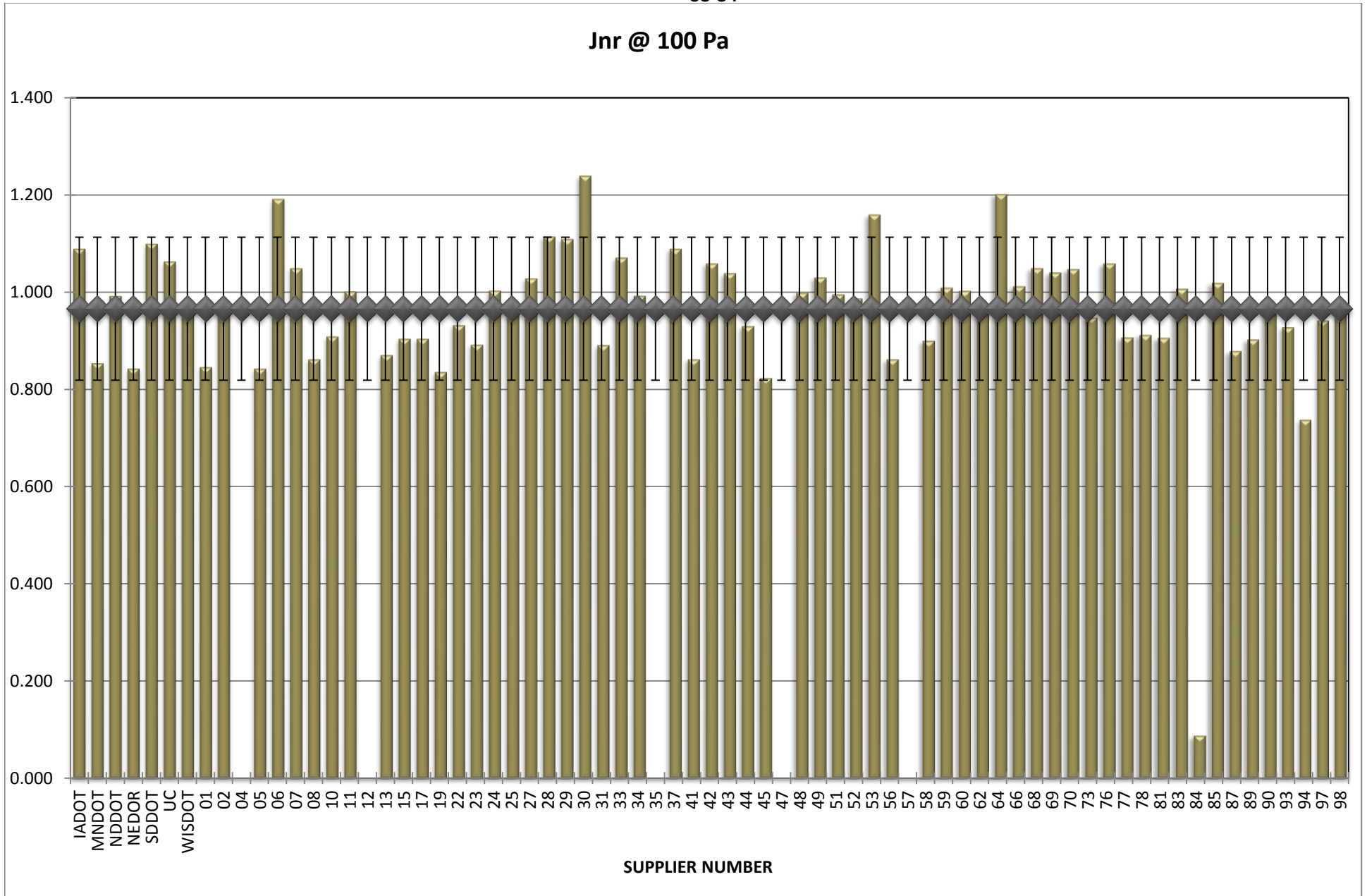
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BBR m-VALUE



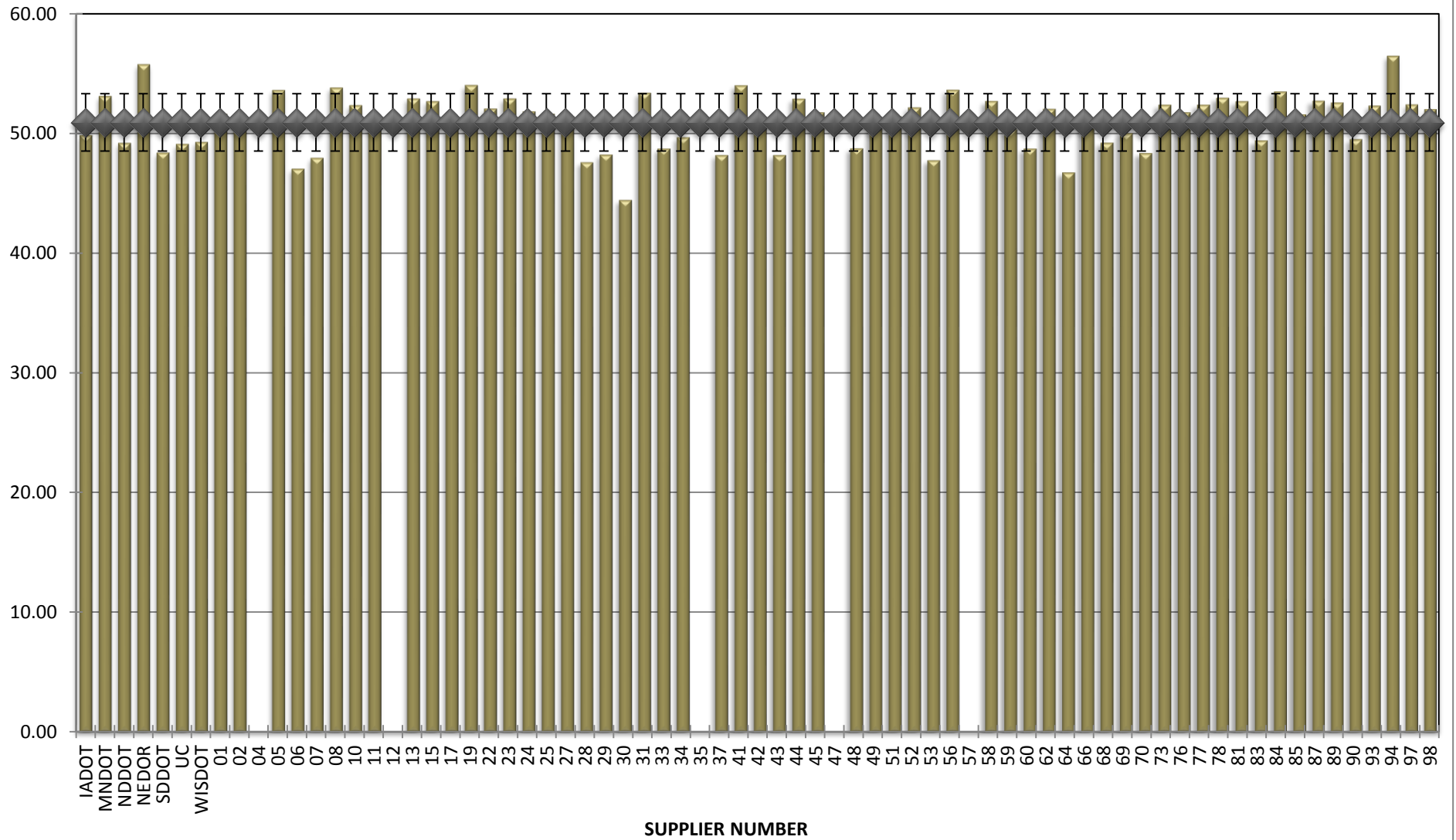
**COMBINED STATE BINDER GROUP ROUND ROBIN
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Jnr @ 100 Pa



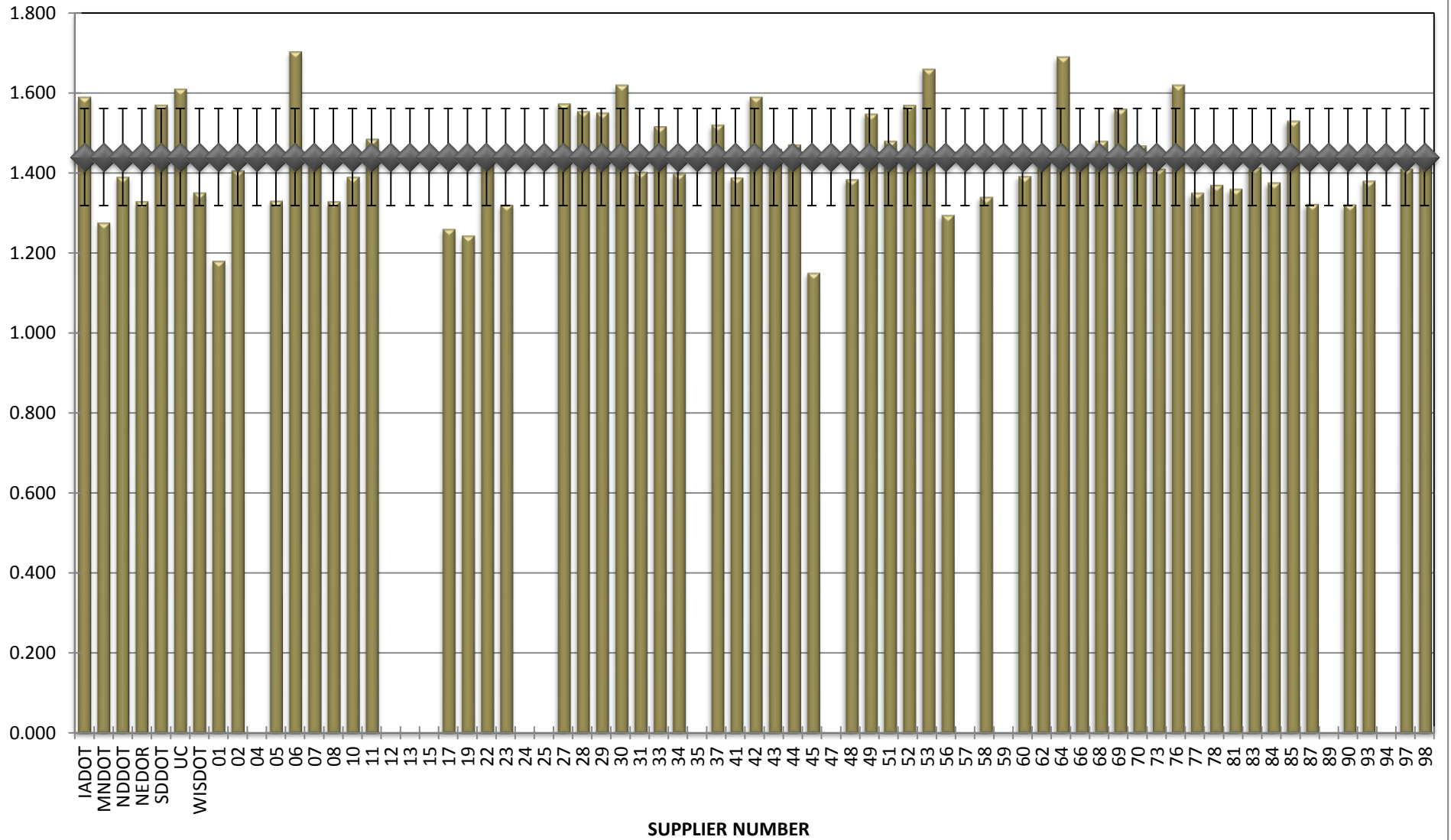
COMBINED STATE BINDER GROUP ROUND ROBIN
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% Recovery @ 100 Pa



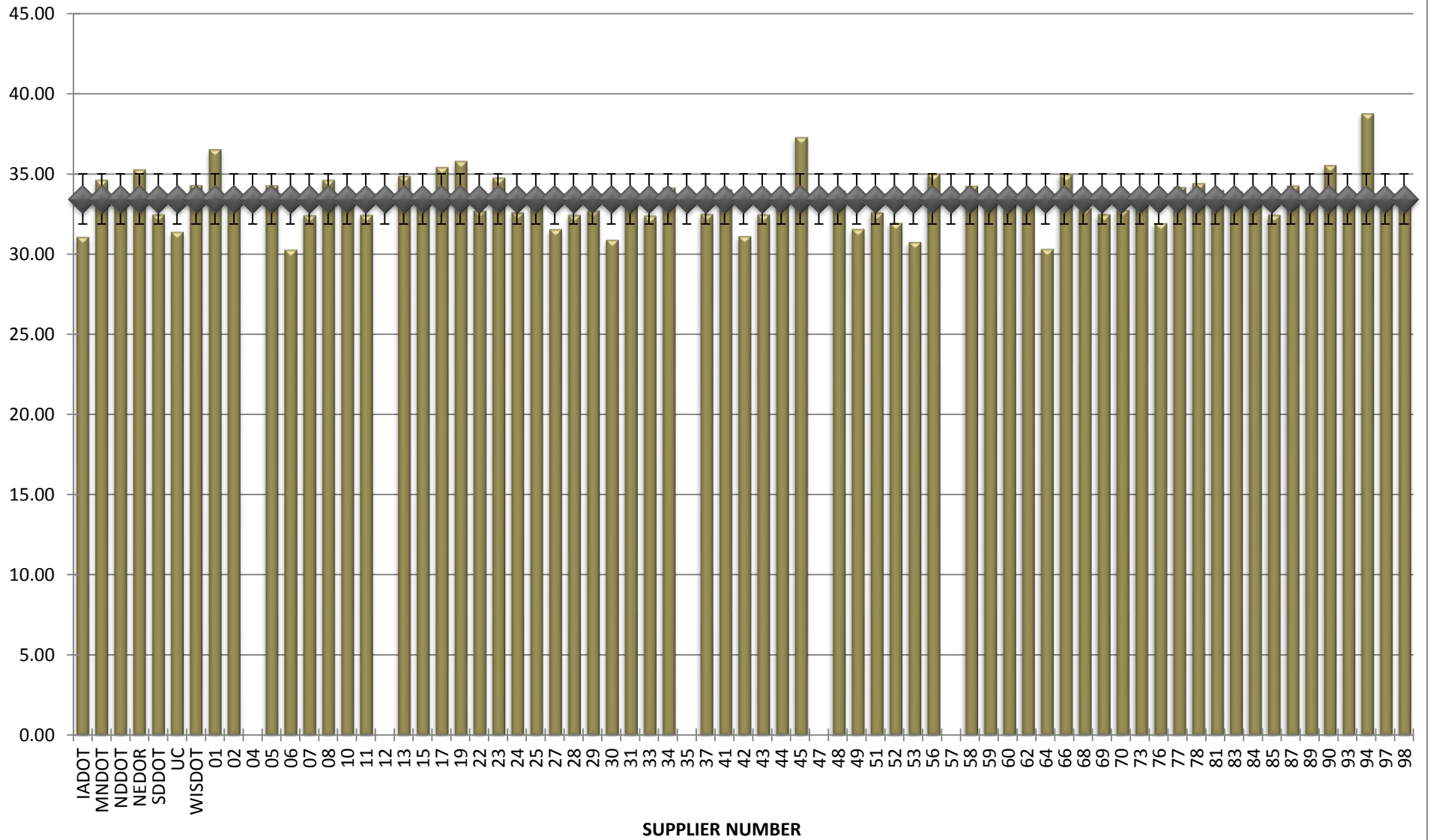
COMBINED STATE BINDER GROUP ROUND ROBIN
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Jnr @ 3200 Pa



**COMBINED STATE BINDER GROUP ROUND ROBIN
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% Recovery @ 3200 Pa



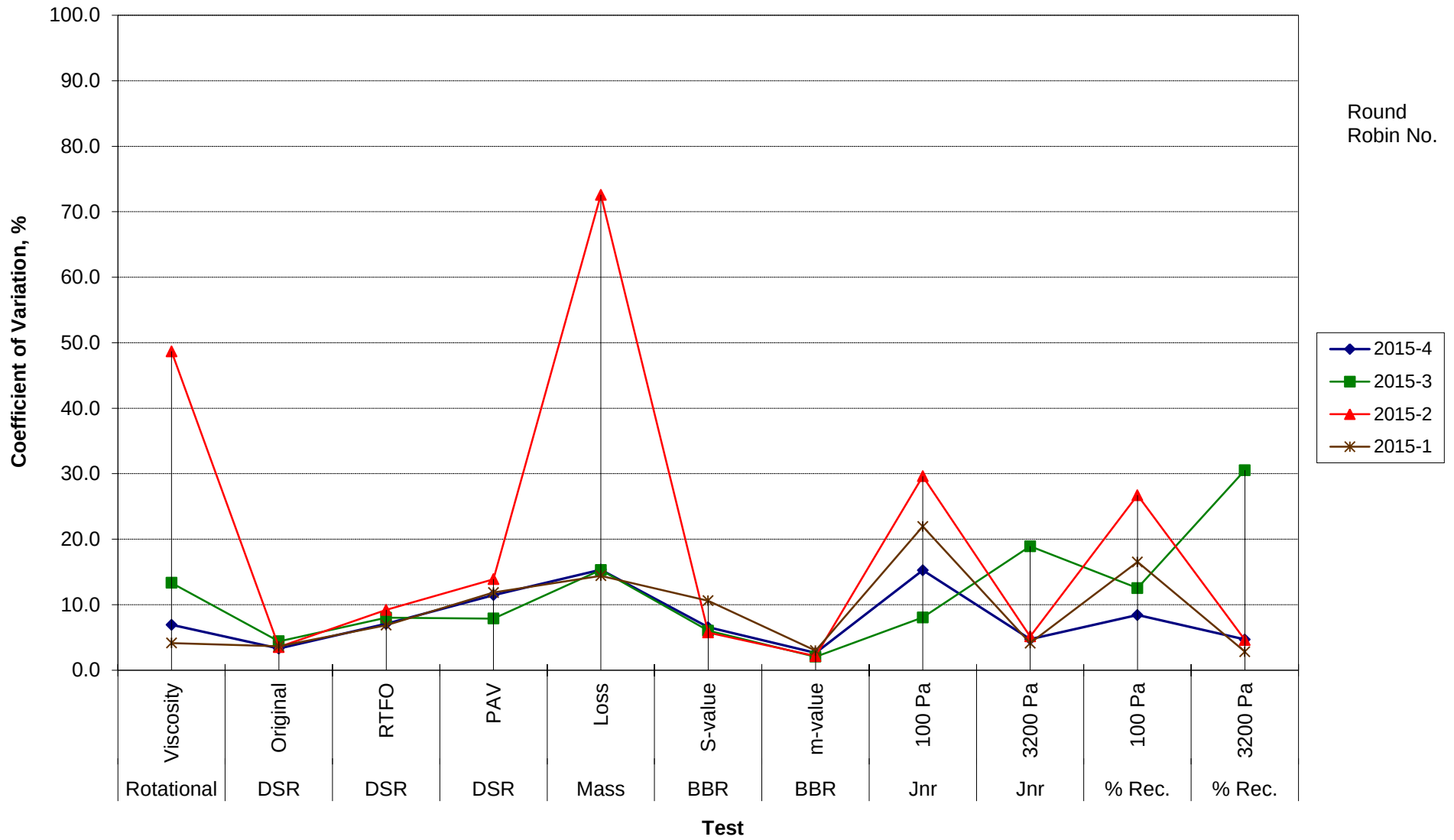
**COMBINED STATE BINDER GROUP ROUND ROBIN
SUMMARY A**

COEFFICIENT OF VARIATION

R R No.	Number of Participants	Coefficient of Variation, %											
		Rotational Viscosity	DSR Original	DSR RTFO	DSR PAV	Mass Loss	BBR S-value	BBR m-value	Jnr 100 Pa	Jnr 3200 Pa	% Rec. 100 Pa	% Rec. 3200 Pa	DTT Strain
2015-4	72	6.934	3.312	7.074	11.465	15.350	6.550	2.640	15.255	4.719	8.413	4.678	73.562
2015-3	69	13.336	4.415	8.017	7.886	15.285	6.039	2.054	8.054	18.907	12.535	30.539	50.366
2015-2	66	48.681	3.526	9.208	13.885	72.575	5.751	2.143	29.617	5.155	26.721	4.610	36.643
2015-1	72	4.150	3.659	6.878	11.854	14.423	10.602	2.986	21.946	4.132	16.523	2.826	18.552

**COMBINED STATE BINDER GROUP ROUND ROBIN
SUMMARY A
PG**

COEFFICIENT OF VARIATION



**COMBINED STATE BINDER GROUP ROUND ROBIN
SUMMARY A
PG**

STATISTICS WITH OUTLIERS REMOVED:

	Rotational Viscosity (Pa.s) @135°C	DSR Original (kPa)	DSR RTFO (kPa)	DSR PAV (kPa)	Mass Loss (%) @163°C	BBR S-value (MPa)	BBR m-value	Jnr @ 100Pa	% RECOV. @ 100Pa	Jnr @ 3200Pa	% RECOV. @ 3200Pa
Average	0.518	1.34	3.41	2,624	0.738	283	0.332	0.979	50.92	1.440	33.37
Std. Dev.	0.0728	0.0434	0.2475	441.10	0.1151	75.83	0.0419	0.2924	13.6182	0.5545	8.7545
Coef. of Var.	14.063	3.226	7.250	16.813	15.596	26.808	12.600	29.857	26.742	38.512	26.237

**COMBINED STATE BINDER GROUP ROUND ROBIN
SUMMARY A**

COEFFICIENT OF VARIATION

R R No.	Number of Participants	Coefficient of Variation, %											
		Rotational Viscosity	DSR Original	DSR RTFO	DSR PAV	Mass Loss	BBR S-value	BBR m-value	Jnr 100 Pa	Jnr 3200 Pa	% Rec. 100 Pa	% Rec. 3200 Pa	DTT Strain
2014-1	72	10.760	5.843	7.228	18.189	14.368	7.133	2.186	20.363	20.016	12.070	4.720	8.048
2014-2	52	9.206	5.504	8.472	11.343	23.598	4.651	2.543	19.850	17.336	5.312	4.362	30.979
2014-3	73	6.670	4.095	5.347	15.777	23.221	6.408	2.506	8.817	5.915	7.950	5.335	37.884
2014-4	69	7.780	2.733	8.730	11.549	15.452	8.069	2.975	11.001	11.328	4.454	6.044	20.593
2015-1	72	4.15	3.659	6.878	11.854	14.423	10.602	2.986	21.946	4.132	16.523	2.826	18.552
2015-2	66	48.6813	3.5255	9.2076	13.885	72.575464	5.750708	2.142825	29.61683	5.154988	26.72097	4.610388	36.64349
2015-3	69	13.3356	4.4147	8.0174	7.8859	15.285329	6.038911	2.054348	8.053945	18.90702	12.53481	30.53914	50.36555
2015-4	72	6.93449	3.3122	7.0742	11.465	15.349729	6.549548	2.640035	15.25514	4.718882	8.41301	4.678398	73.56208