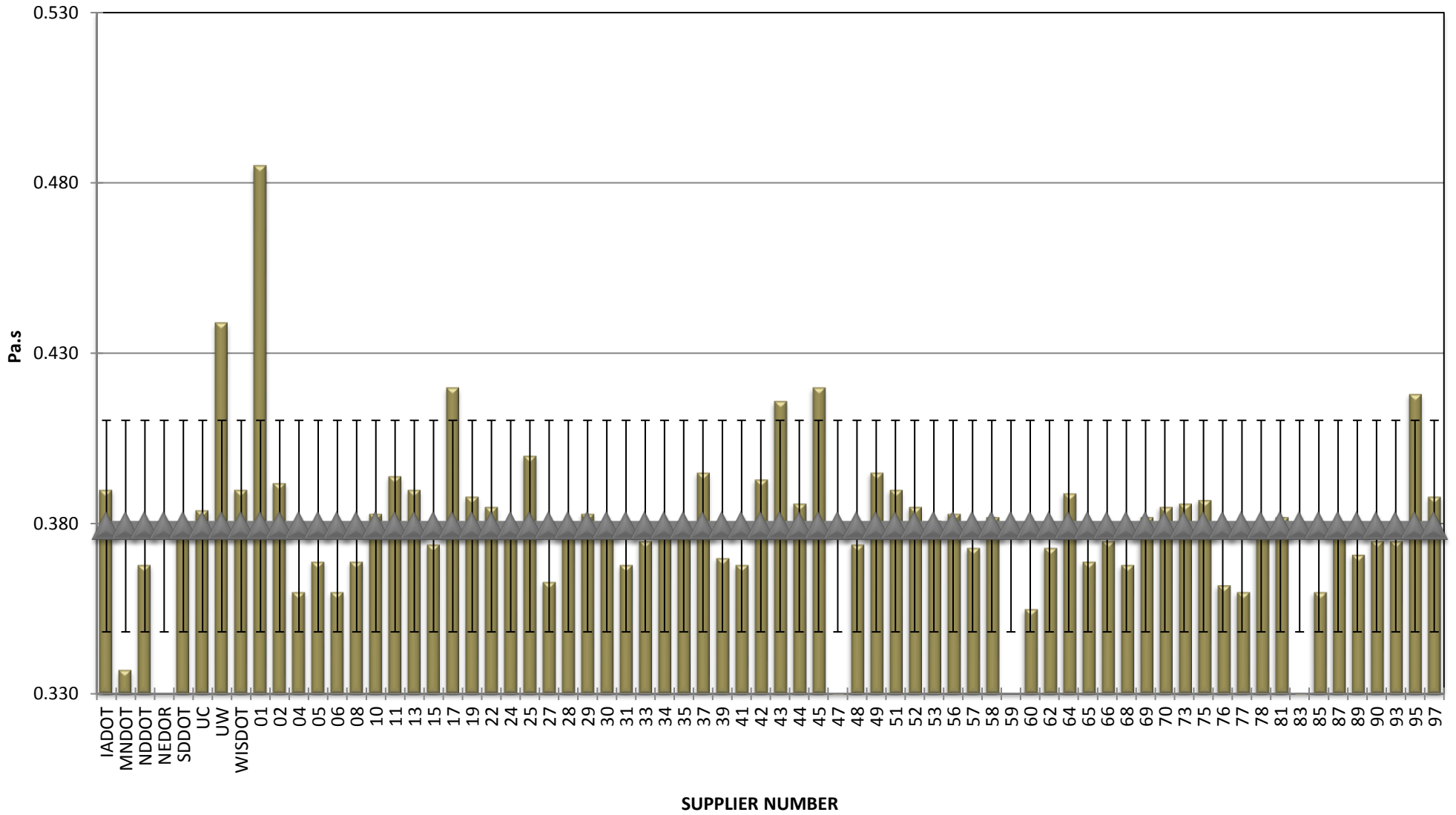


COMBINED STATE BINDER GROUP ROUND ROBIN SUMMARY A 2017-2
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Supplier Number	Rotational Viscosity (Pa.s) @135°C	DSR Original (kPa)	DSR RTFO (kPa)	DSR PAV (kPa)	Mass Loss (%) @163°C	BBR S-value (MPa)	BBR m-value	Jnr @ 100 Pa	% Recov. @ 100 Pa	Jnr @ 3200 Pa	% Recov. @ 3200 Pa
IADOT	0.390	1.16	2.710	3,000	0.314	169	0.346	1.414	6.03	1.497	2.65
MNDOT	0.337	1.16	3.260	3,390	0.313	151	0.361	1.221	3.01	1.221	3.01
NDDOT	0.368	1.16	2.920	3,260	0.319			1.331	7.20	1.453	2.90
NEDOR		1.16	3.080	3,481	0.237	167	0.343	1.290	6.01	1.380	3.27
SDDOT	0.379	1.20	3.060	3,540	0.642	171	0.347	1.018	2.28	1.070	4.66
UC	0.384	1.15	2.740	3,340	0.203	174	0.355	1.363	6.50	1.526	2.60
UW	0.439	1.17	2.790	2,733	0.430	168	0.345	1.323	5.31	1.411	2.82
WISDOT	0.390	1.17	2.930	1,270	0.254	162	0.350	1.270	5.87	1.370	2.51
01	0.485	1.10	2.790	3,030	0.259	164	0.350	1.300	6.90	1.400	2.90
02	0.392	1.20	2.610	2,946	0.243	155	0.378	1.263	5.54	1.350	2.83
04	0.360	1.13	2.413	2,830	0.129	159	0.368				
05	0.369	1.09	2.980	3,723	0.233	141	0.352	1.025	7.65	1.101	4.14
06	0.360	1.08	2.680	3,110	0.399	154	0.358	1.400	7.71	1.580	2.14
08	0.369	1.11	2.990	3,405	0.224	152	0.355	1.082	7.79	1.164	4.13
10	0.383	1.15	2.894	3,301	0.304	164	0.351	1.255	5.70	1.382	2.48
11	0.394	1.19	3.090	3,345	0.181	162	0.350	1.228	6.08	1.317	3.31
13	0.390	1.17	3.040	2,990	0.342	155	0.361	1.163	7.51	1.275	3.04
15	0.374	1.15	2.980	3,040	0.292	163	0.350	1.261	5.77	1.349	2.73
17	0.420	1.10	3.170	3,060	0.266	166	0.345	1.200	7.40	1.300	3.30
19	0.388	1.13	3.137	3,284	0.284	159	0.359	1.190	7.90	1.289	3.50
22	0.385	1.14	2.984	3,505	0.331	170	0.354	1.201	6.18	1.333	2.41
24	0.378	1.10	3.090	3,440	0.303	160	0.387	1.224	7.69	1.347	3.00
25	0.400	1.18	3.468	3,861	0.368	163	0.356	1.140	7.44	1.229	3.74
27	0.363	1.14	2.930	3,430	0.262	165	0.355	1.113	6.61	1.192	3.18
28	0.379	1.17	2.860	2,779	0.185	182	0.344	1.393	4.58	1.476	2.88
29	0.383	1.18	3.300	3,246	0.314	167	0.354	1.124	8.44	1.228	3.88
30	0.380	1.17	3.160	3,521	0.380	177	0.353	1.175	6.60	1.267	2.80
31	0.368	1.11	2.700	3,520	0.222	155	0.352	1.063	8.30	1.063	4.11
33	0.375	1.15	2.950	3,240	0.248	161	0.356	1.270	6.78	1.380	2.68
34	0.378	1.20	2.970	3,650	0.292	172	0.360	1.270	6.41	1.360	3.01
35	0.380	1.13	3.070	3,460	0.285	182	0.349				
37	0.395	1.12	2.910	3,660	0.348	175	0.351	1.300	8.20	1.400	3.10
39	0.370	1.16	2.980	2,830	0.294	160	0.359	1.242	7.23	1.364	2.71
41	0.368	1.06	3.030	3,480	0.239	159	0.355	0.981	6.98	1.042	4.40
42	0.393	1.17	2.990	3,070	0.333	163	0.362				
43	0.416	1.20	2.800	3,470	0.246	162	0.361	1.340	5.42	1.440	2.23
44	0.386	1.16	2.899	3,246	0.306	163	0.358	1.236	5.97	1.368	2.16
45	0.420	1.08	2.750	3,730	0.281	168	0.340	1.200	8.80	1.400	3.10
47	0.315	1.11	2.606	2,683	0.225	156	0.361				
48	0.374	1.20	3.100	3,090	0.316	171	0.354	1.240	6.72	1.340	3.11
49	0.395	1.19	2.900	2,920	0.325	154	0.367				
51	0.390	1.16	3.049	3,385	0.290	160	0.363	1.242	6.40	1.324	3.30
52	0.385	1.14	3.013	3,029	0.317	159	0.358	1.204	6.15	1.335	2.43
53	0.381	1.14	2.800	3,400	0.303	156	0.355	1.350	5.49	1.450	2.28
56	0.383	1.10	2.960	3,310	0.319	171	0.356	1.278	6.26	1.381	2.53
57	0.373	1.11	2.676	2,703	0.193	156	0.366	1.535	5.80	1.597	2.90
58	0.382	1.12	2.630	3,540	0.295	172	0.359	1.418	5.42	1.535	1.99
59		1.20	2.970	3,450	0.271	172	0.355	1.220	8.18	1.340	3.25
60	0.355	1.18	3.040	3,610	0.349	147	0.351	1.280	5.84	1.348	2.38
62	0.373	1.12	3.020	3,450	0.301	176	0.358	1.238	6.65	1.340	2.83
64	0.389	1.14	2.810	3,140	0.292	170	0.355	2,590	5.18	1.440	2.29
65	0.369	1.12	3,680	3,419	0.321	145	0.356	1.337	6.73	1.451	2.87
66	0.375	1.17	2.810	2,678	0.210	177	0.348	1.380	3.98	1.454	2.76
68	0.368	1.15	2.870	3,790	0.300	171	0.353	1.320	9.00	1.447	3.62
69	0.382	1.15	2.780	3,562	0.189	174	0.353	1.347	6.70	1.510	2.70
70	0.385	1.16	2.555	2,940	0.246	159	0.360	1.581	3.52	1.680	2.56
73	0.386	1.13	3.030	3,200	0.356	146	0.356	1.227	6.44	1.322	2.86
75	0.387	1.16	2.927	3,077	0.301	162	0.355	1.236	5.90	1.368	2.41
76	0.362	1.16	2.800	4,160	0.243	165	0.356	1.371	5.24	1.466	2.32
77	0.360	1.17	2.780	3,780	0.310	162	0.351	1.229	5.66	1.326	2.69
78	0.380	1.11	3.010	3,580	0.316	172	0.357	1.255	6.34	1.370	1.41
81	0.382	1.11	2.710	3,420	0.304	174	0.360	1.444	5.47	1.561	1.99
83	0.197	1.13	3.209	3,125	0.512	170	0.351	1.174	7.88	1.279	3.61
85	0.360	1.15	2.710	3,620	0.270	172	0.351	1.425	4.71	1.519	2.11
87	0.379	1.13	2.830	3,540	0.244	175	0.342	1.310	6.70	1.429	2.56
89	0.371	1.17	3.060	2,670	0.313	166	0.363	1.227	6.03	1.315	2.77
90	0.375	1.15	2.990	2,873	0.261	172	0.339	1.284	7.64	1.403	2.95
93	0.375	1.16	3.020	3,135	0.396	162	0.365	1.189	7.02	1.281	3.49
95	0.418	1.22	2.860	3,220	0.243	161	0.356	1.280	5.96	1.370	2.40
97	0.388	1.18	3.146	2,990	0.314	151	0.367	1.188	7.80	1.286	3.40
98	0.390	1.18	3.116	3,159	0.274	160	0.370	1.205	7.20	1.297	3.30
99	0.375	1.18	2.820	2,572	0.280	202	0.341	1.328	7.08	1.451	2.81
Average	0.379	1.15	2.936	3,242	0.293	164	0.355	1.281	6.43	1.363	2.91
Std. Dev.	0.031	0.03	0.205	402	0.073	10	0.008	0.196	1.29	0.123	0.61
Coef. of Var.	8.189	2.94	6.977	12	25.015	6	2.306	15.323	20.05	9.000	20.78

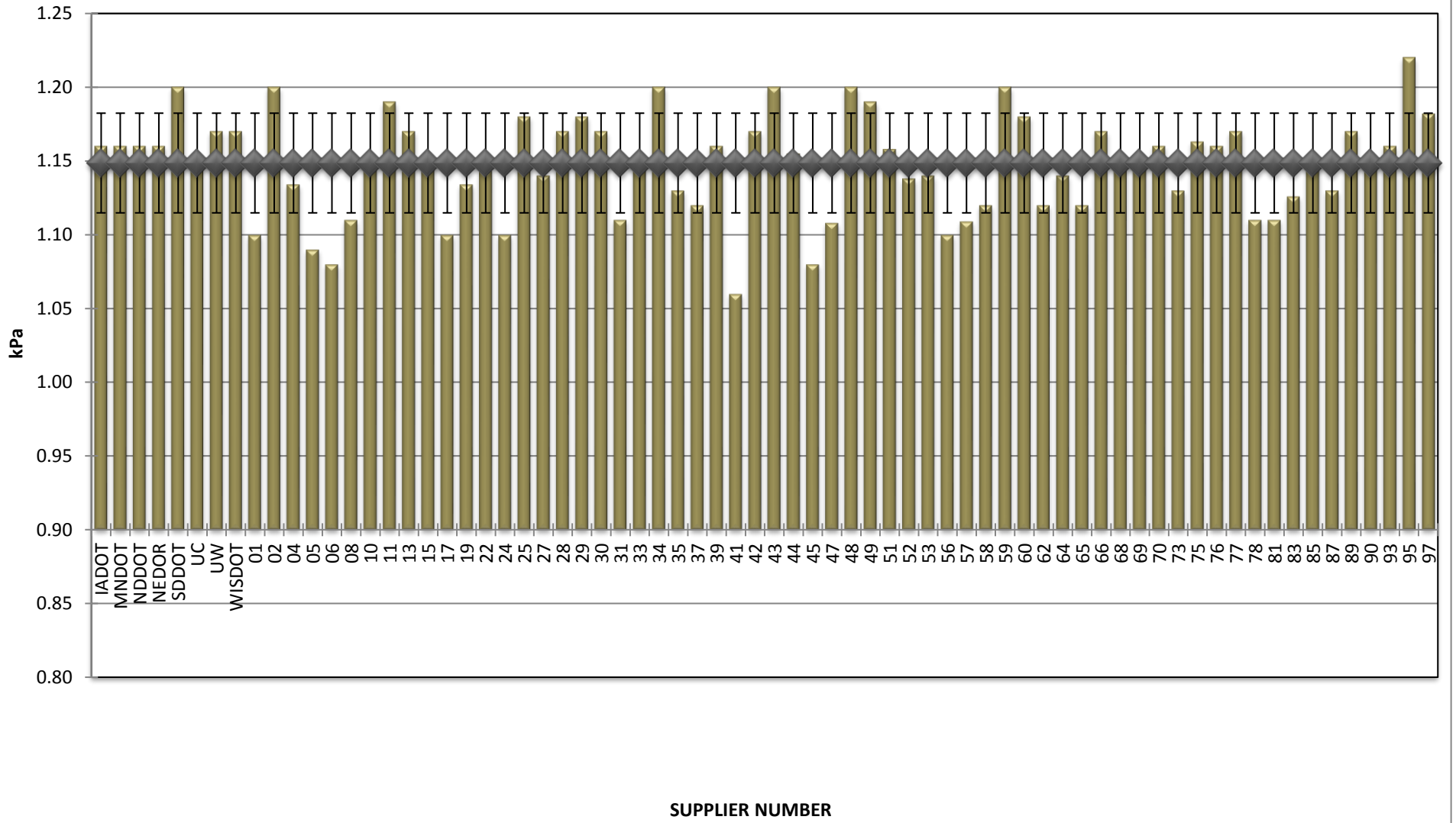
**COMBINED STATE BINDER GROUP ROUND ROBIN
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ROTATIONAL VISCOSITY



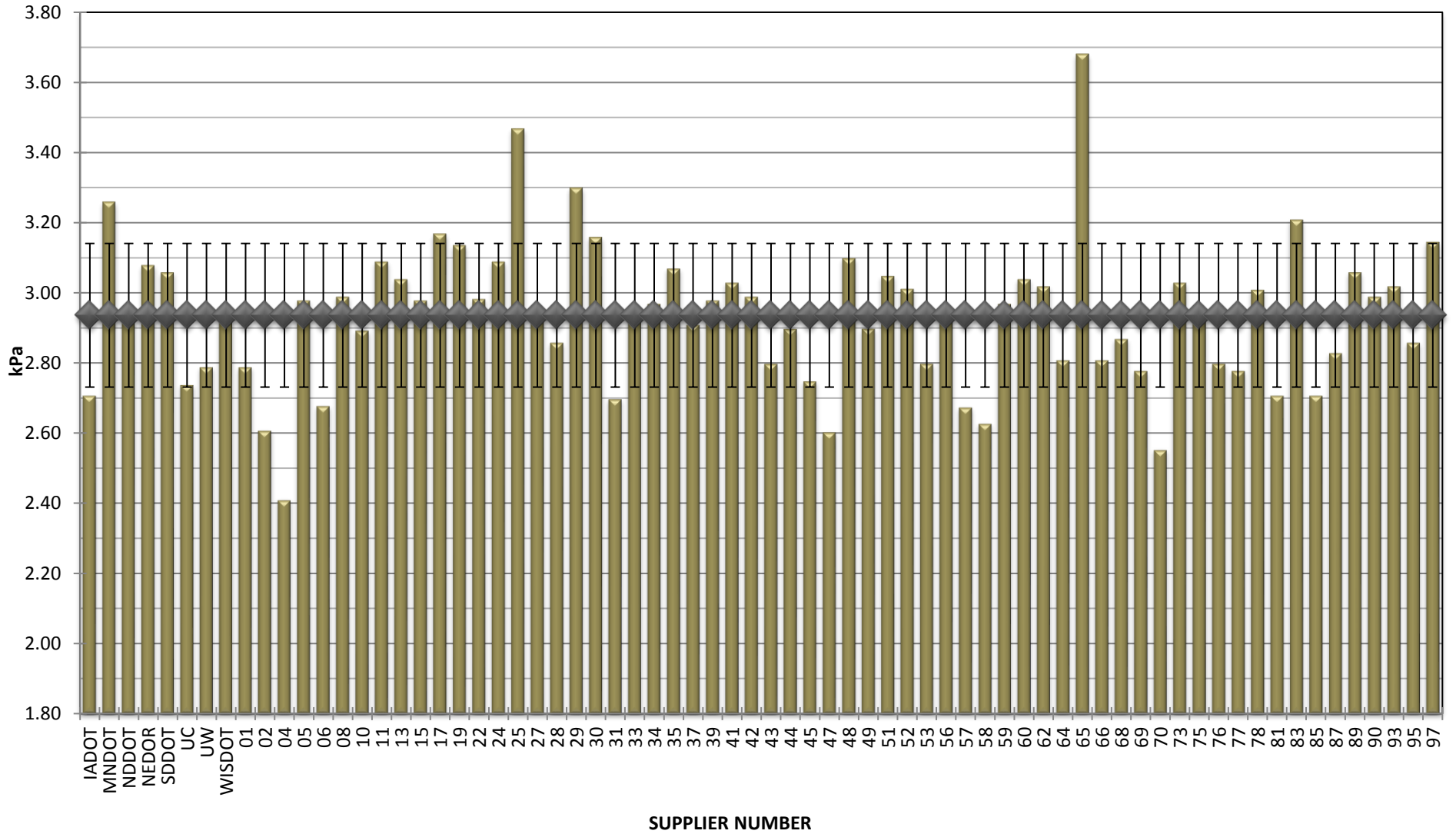
**COMBINED STATE BINDER GROUP ROUND ROBIN
SUMMARY A 2017-2
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DSR - ORIGINAL



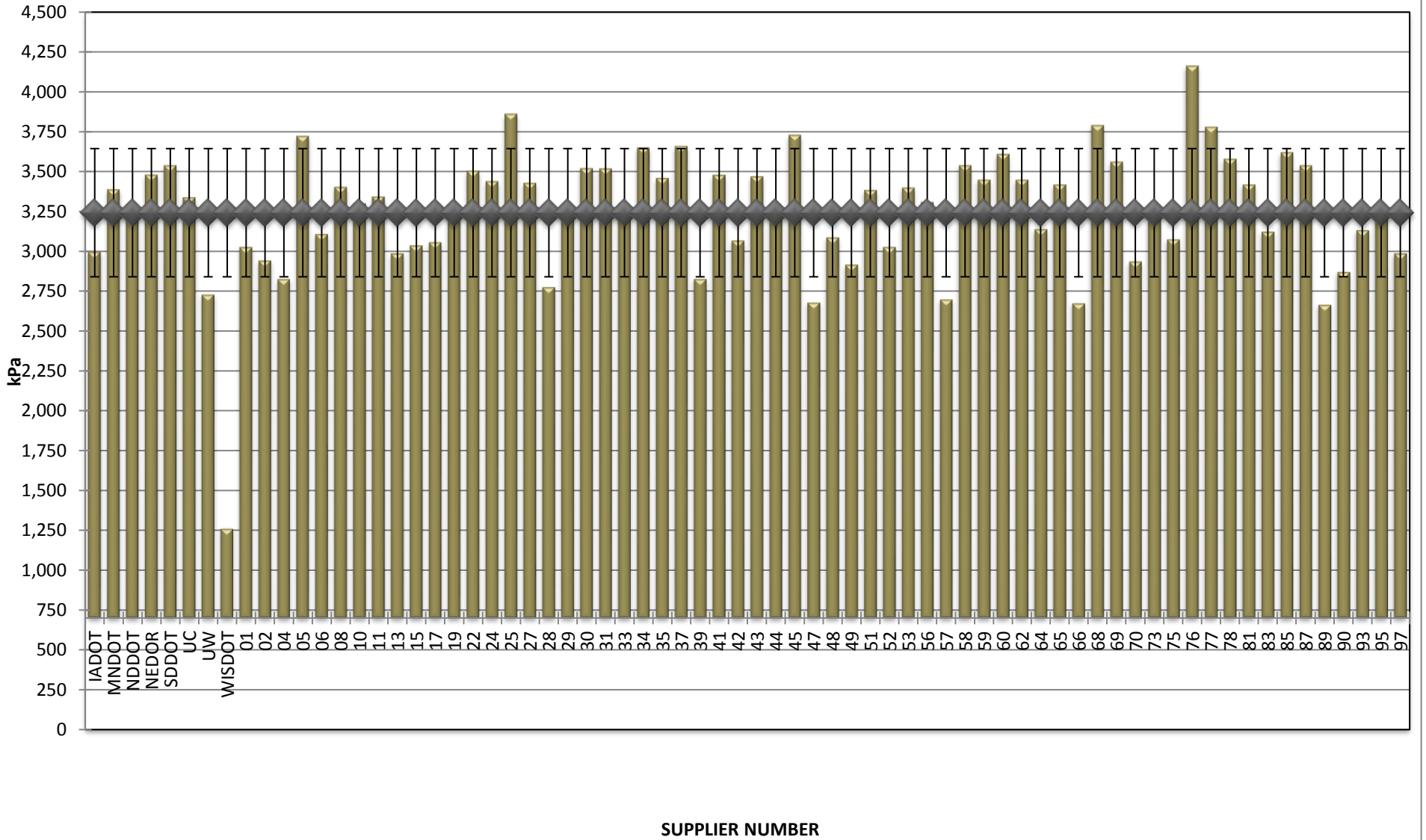
**COMBINED STATE BINDER GROUP ROUND ROBIN
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DSR - RTFO



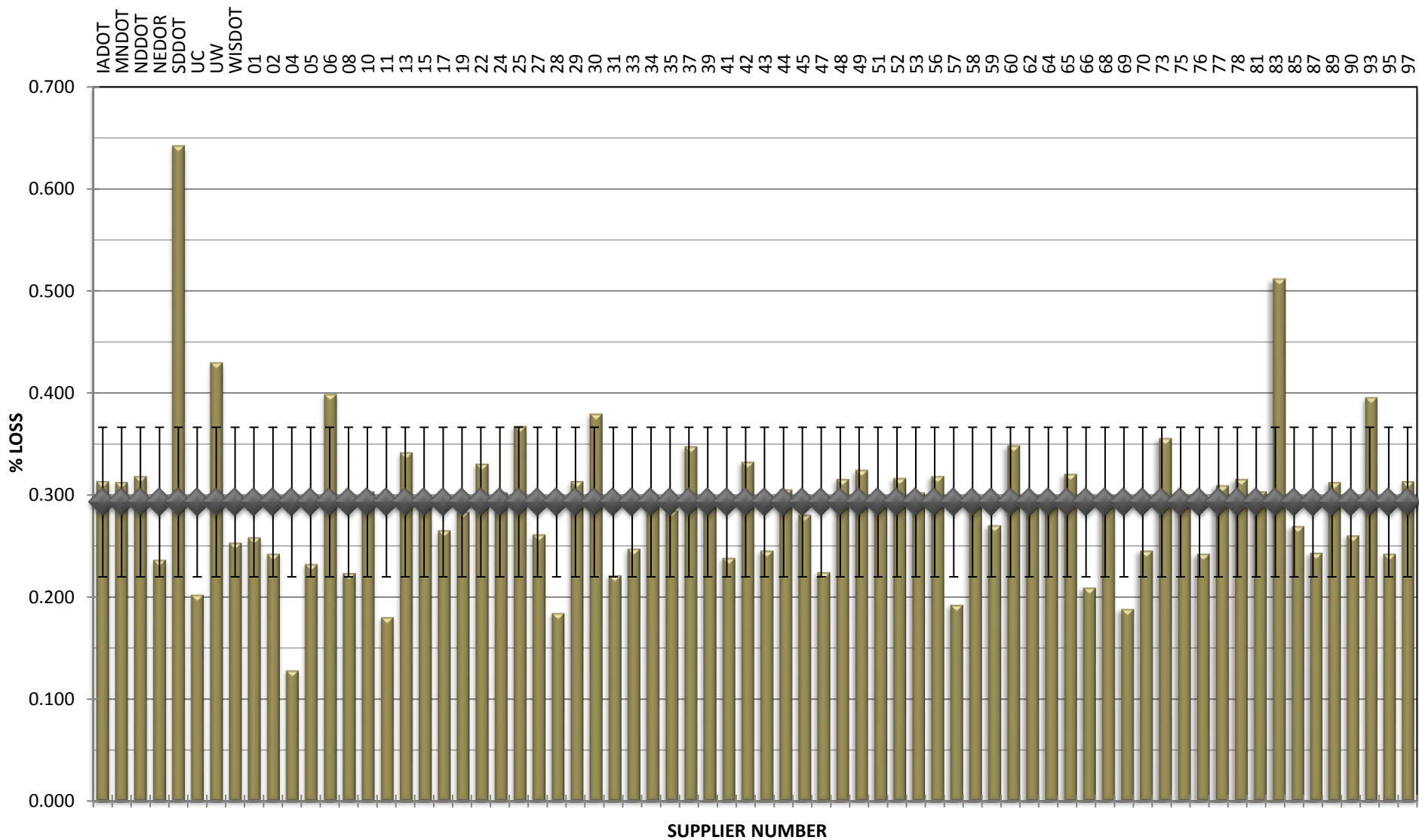
**COMBINED STATE BINDER GROUP ROUND ROBIN
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DSR - PAV



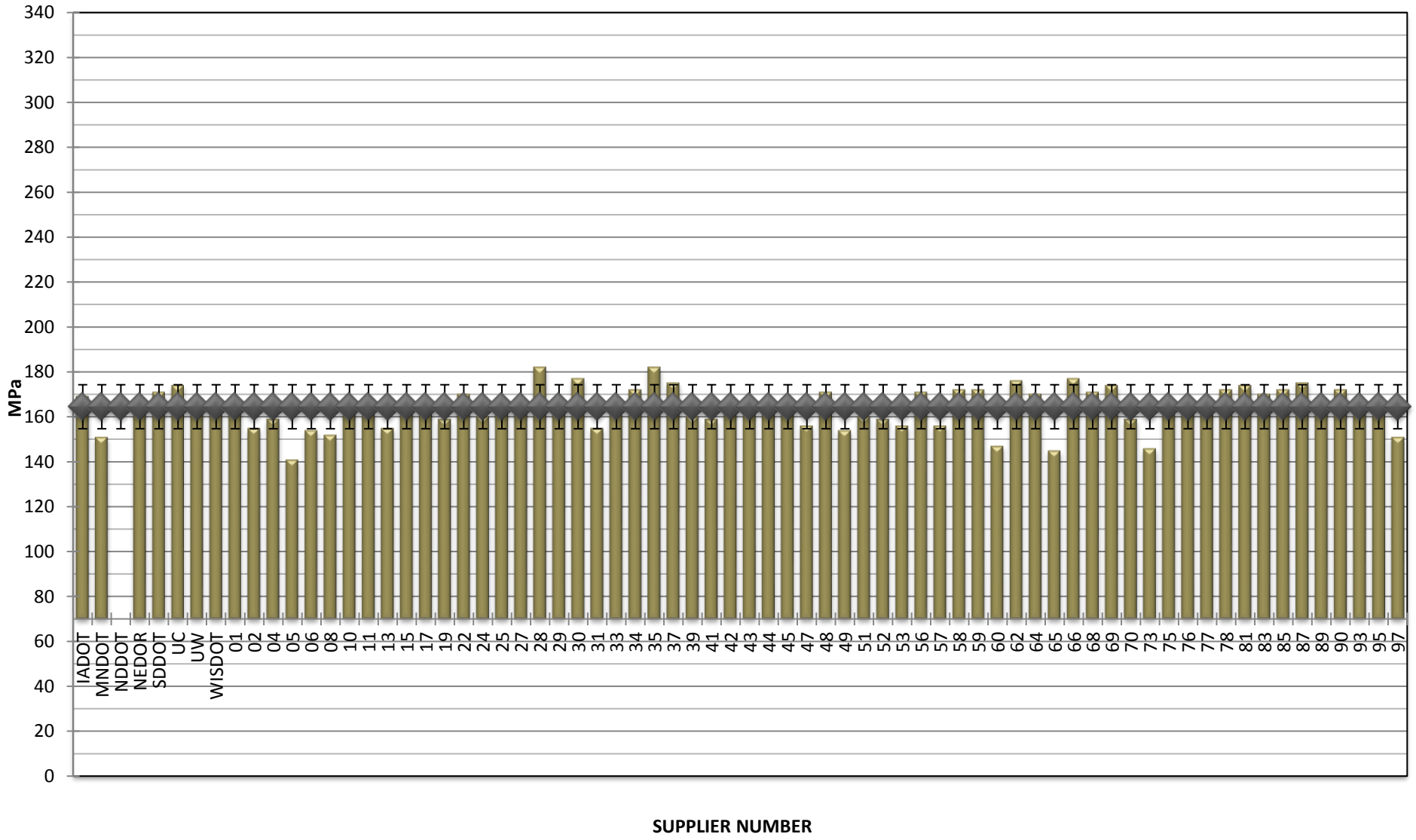
**COMBINED STATE BINDER GROUP ROUND ROBIN
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RTFO MASS LOSS



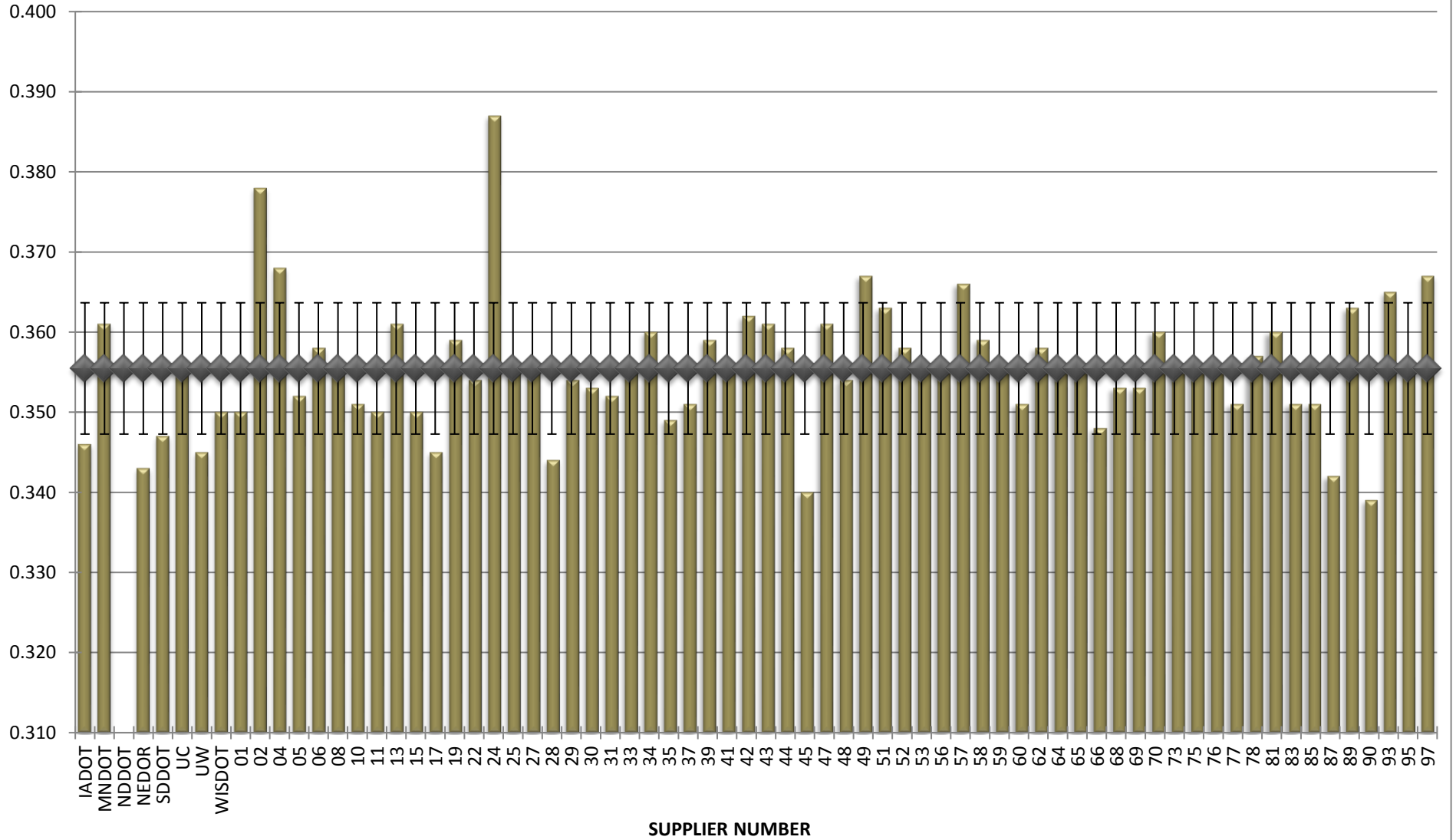
**COMBINED STATE BINDER GROUP ROUND ROBIN
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BBR STIFFNESS



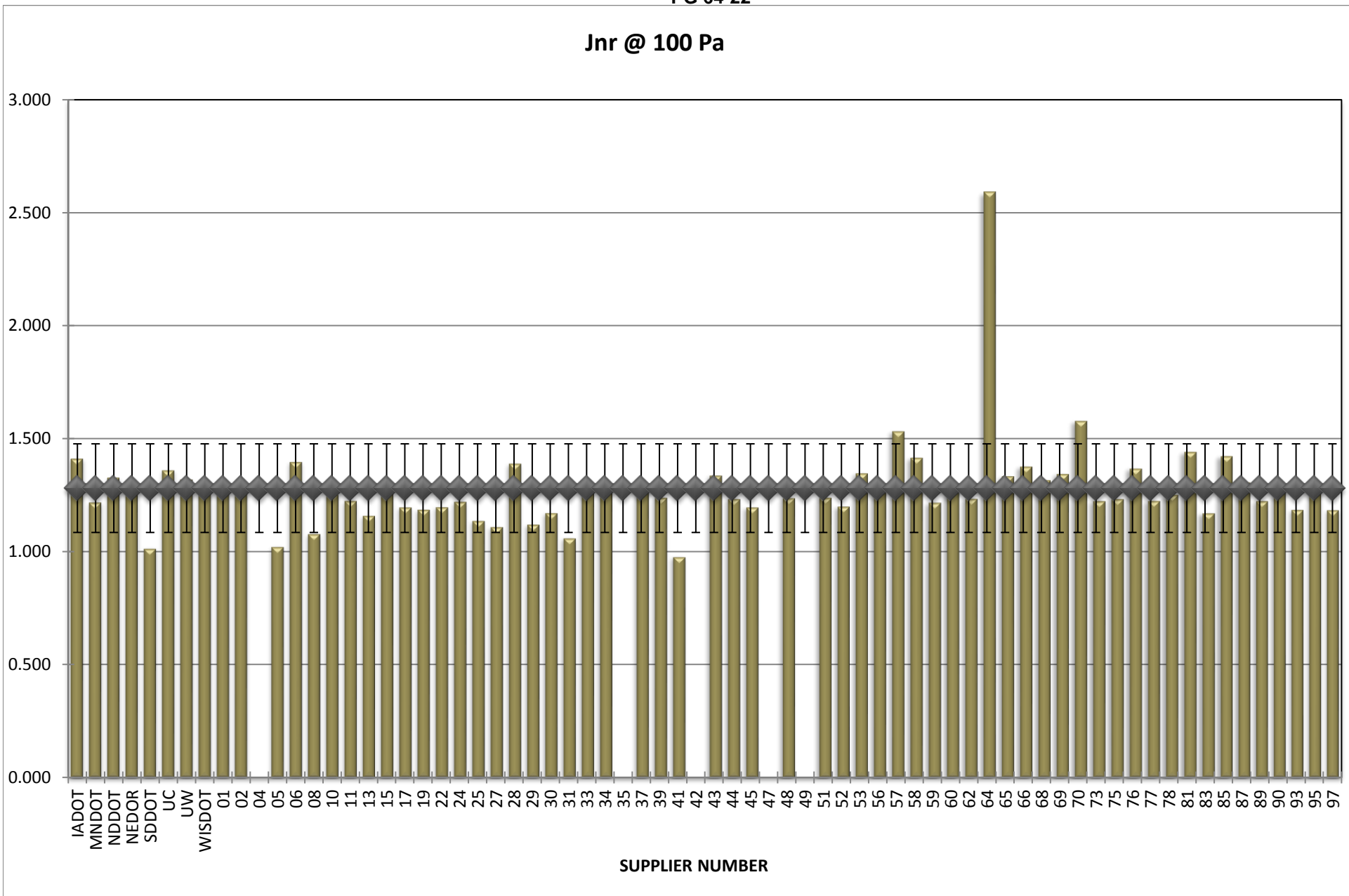
**COMBINED STATE BINDER GROUP ROUND ROBIN
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BBR m-VALUE



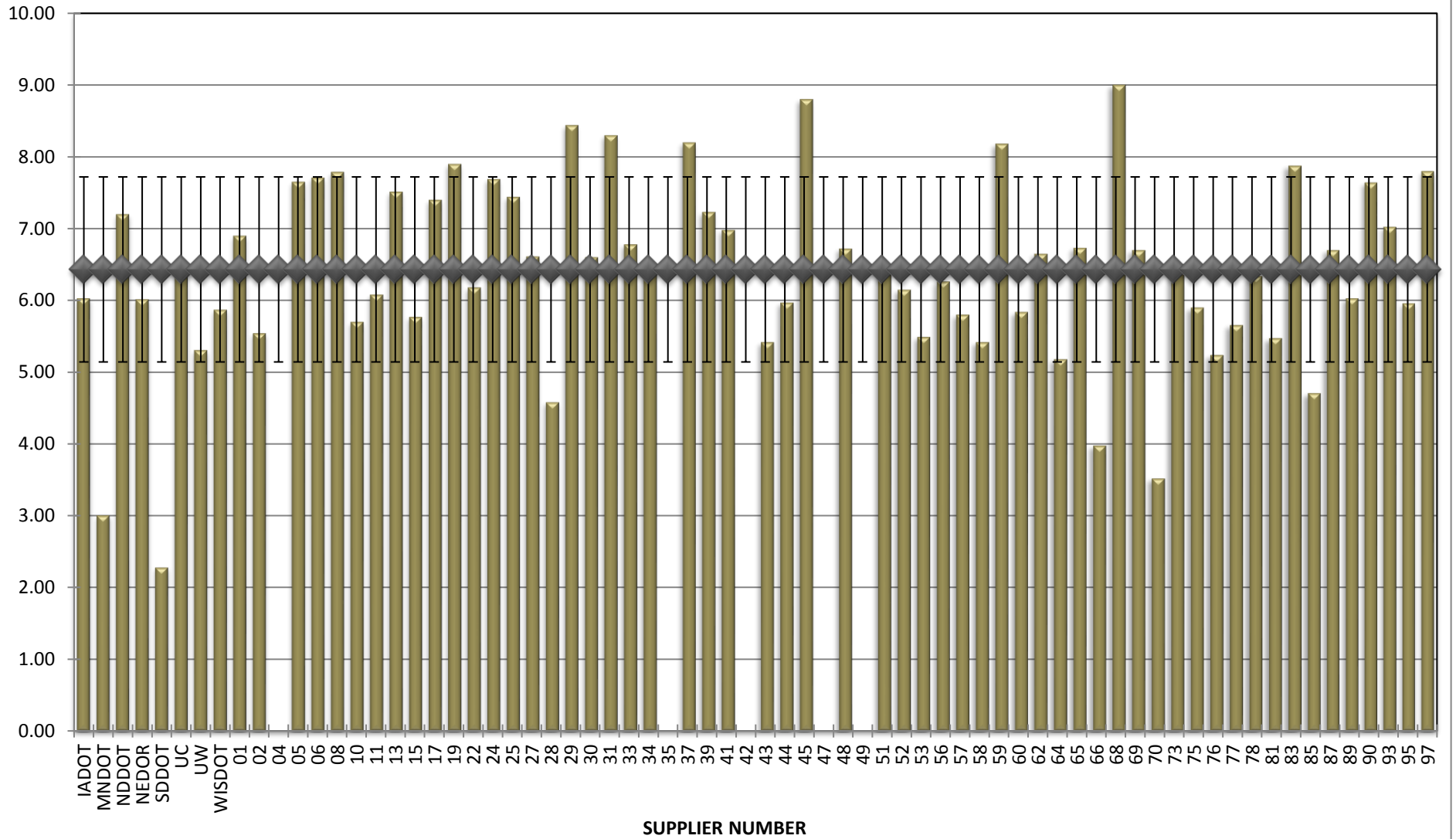
**COMBINED STATE BINDER GROUP ROUND ROBIN
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Jnr @ 100 Pa



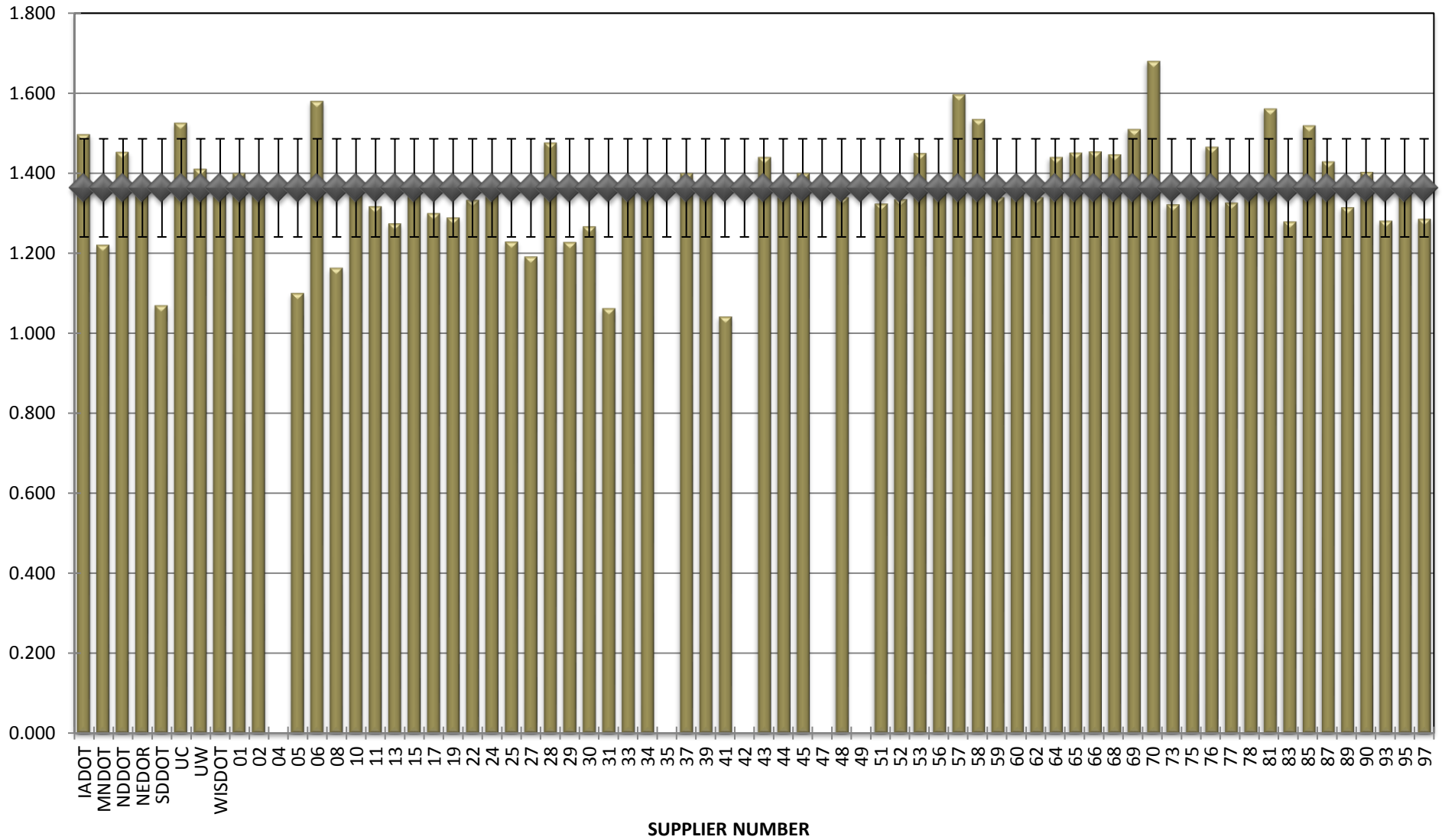
**COMBINED STATE BINDER GROUP ROUND ROBIN
SUMMARY A 2017-2
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% Recovery @ 100 Pa



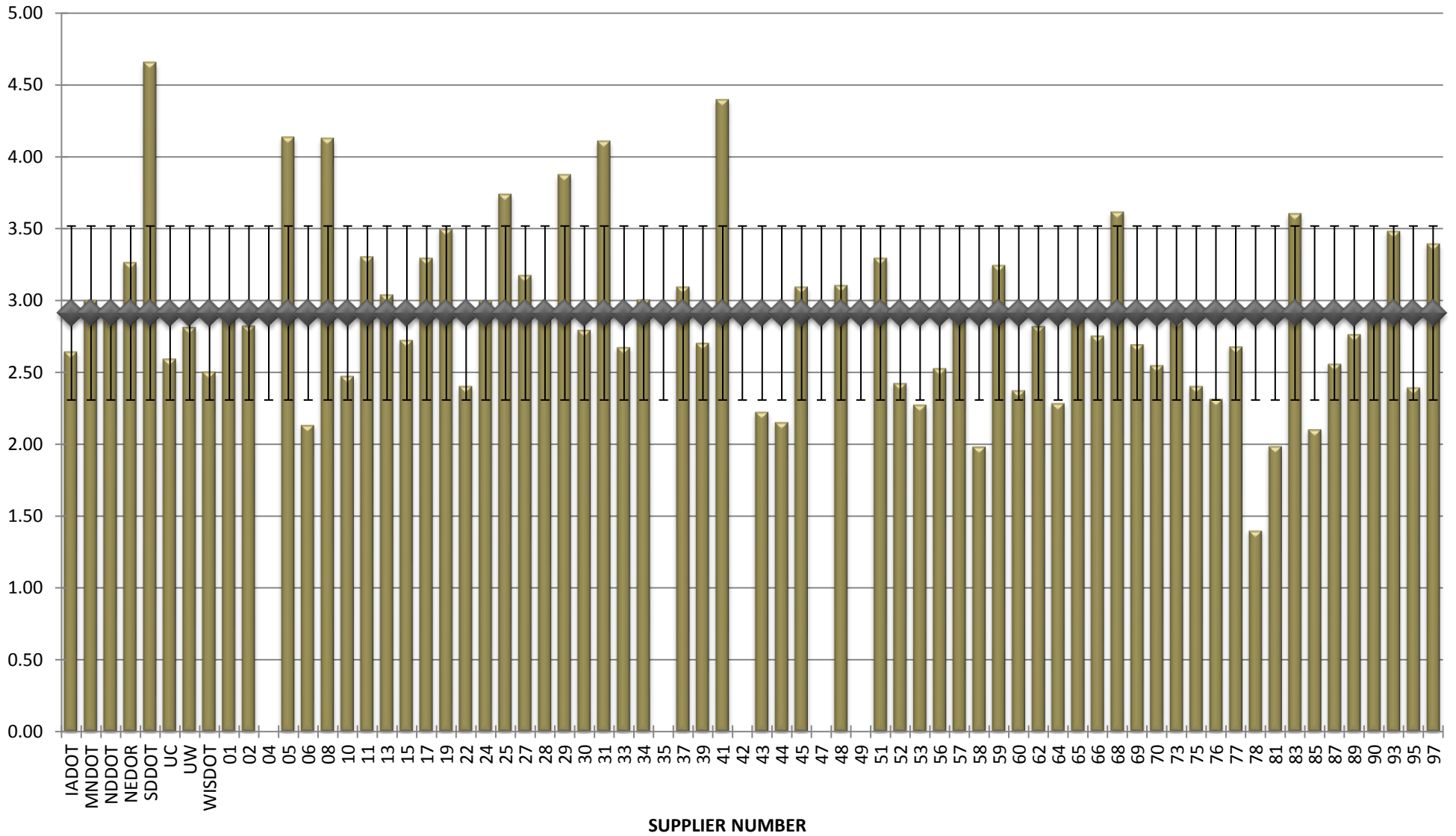
**COMBINED STATE BINDER GROUP ROUND ROBIN
SUMMARY A 2017-2
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Jnr @ 3200 Pa



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



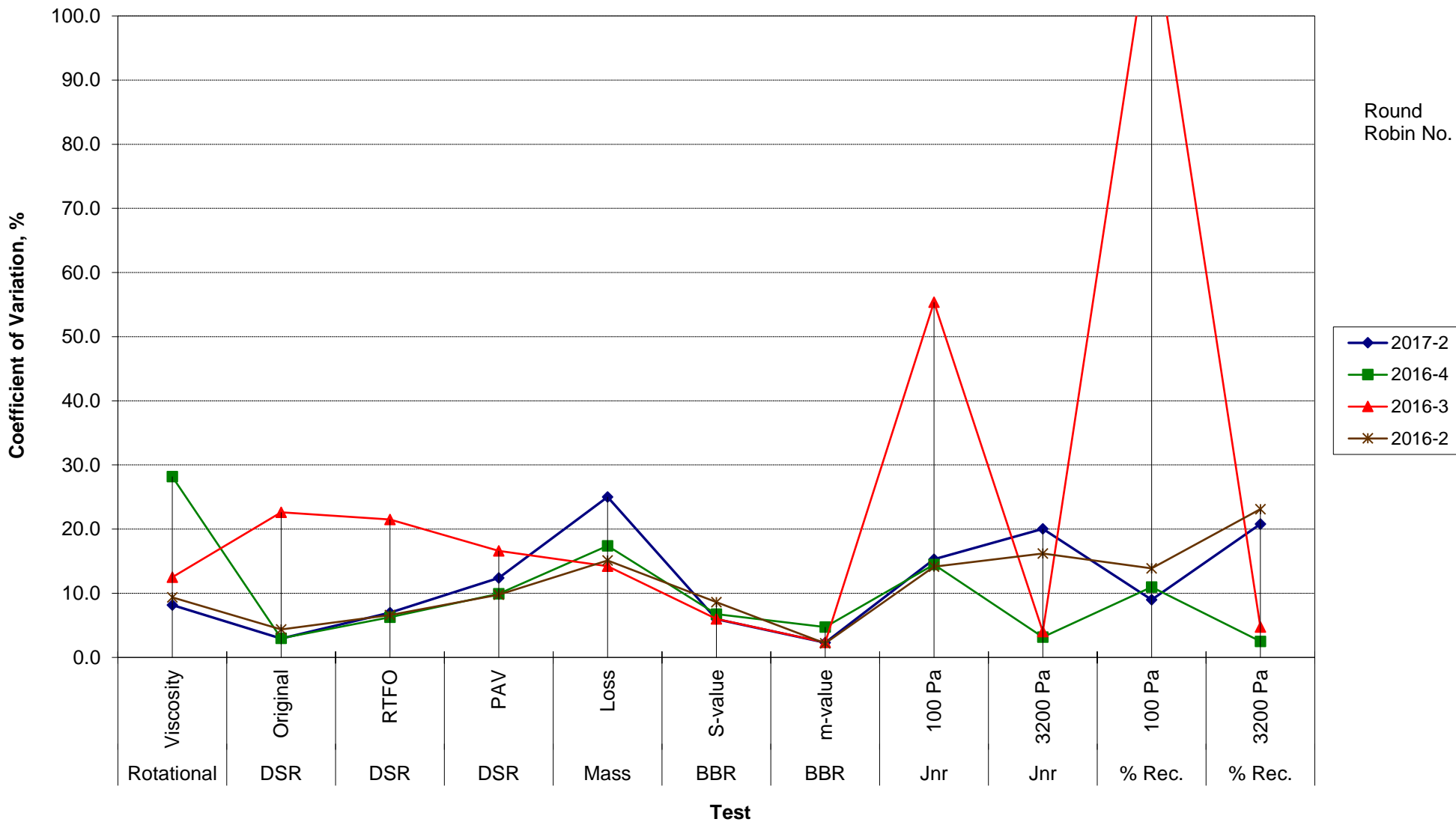
**COMBINED STATE BINDER GROUP ROUND ROBIN
SUMMARY A**

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
2017-2	72	8.189	2.942	6.977	12.404	25.015	5.960	2.306	15.323	20.048	9.000	20.782	38.912
2016-4	72	28.172	2.989	6.269	9.911	17.390	6.765	4.719	14.487	3.161	10.957	2.508	15.867
2016-3	64	12.516	22.641	21.497	16.608	14.221	5.999	2.339	55.384	4.044	115.654	4.750	41.519
2016-2	74	9.354	4.354	6.608	9.769	15.132	8.634	2.198	14.135	16.185	13.869	23.119	70.706

**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	0.380	1.15	2.93	3,270	0.293	164	0.355	1.261	6.49	1.363	2.91
Std. Dev.	0.0184	0.0338	0.1867	321.53	0.0616	8.82	0.0070	0.1122	1.2042	0.1238	0.6128
Coef. of Var.	4.831	2.943	6.382	9.833	21.015	5.377	1.968	8.900	18.542	9.084	21.034

**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
2016-1	62	26.2663	3.967	6.9128	10.424	20.650786	7.371125	3.279961	25.7382	4.753085	29.48599	6.309624	21.62796
2016-2	74	9.35379	4.3545	6.6077	9.769	15.131773	8.633694	2.198488	14.13471	16.1848	13.86873	23.11892	70.70604
2016-3	64	12.5161	22.641	21.497	16.608	14.221102	5.999379	2.33875	55.38365	4.044346	115.6536	4.750328	41.51925
2016-4	72	28.1722	2.9891	6.2693	9.9115	17.39022	6.764994	4.719315	14.48671	3.160854	10.95691	2.507913	15.86679
2017-2	72	8.1892	2.9418	6.9766	12.404	25.015248	5.960391	2.305579	15.32323	20.04762	9.000087	20.78232	38.9118