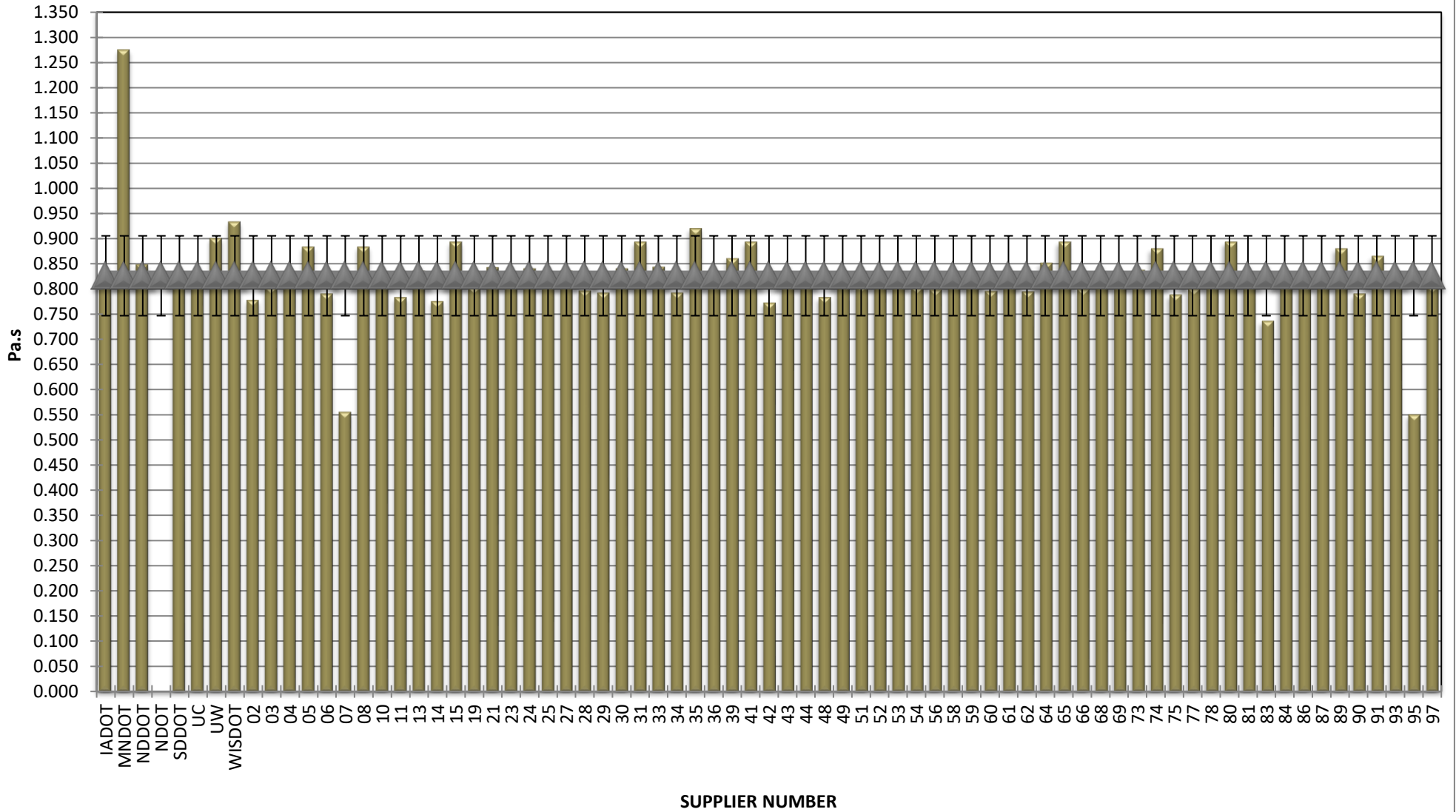


COMBINED STATE BINDER GROUP ROUND ROBIN SUMMARY A 2022-2
PG 58V-28

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	0.828	3.72		3,960	0.523	223	0.320	0.203	70.90	0.284	61.70
MNDOT	1.275	3.52		4,140	0.476	227	0.322	0.270	66.49	0.370	56.30
NDDOT	0.848	3.67		4,431	0.596	216	0.328	0.236	68.57	0.312	59.95
NDOT		3.85		3,979	0.449	215	0.330	0.196	73.00	0.294	62.40
SDDOT	0.825	3.69		4,850	0.385	215	0.315	0.234	68.28	0.340	55.95
UC	0.823	3.72		4,958	0.465	227	0.329	0.246	66.50	0.272	65.30
UW	0.900	3.38		3,791	1.000	226	0.317	0.222	70.00	0.298	61.27
WISDOT	0.933	4.07		1,270	0.462			0.219	68.90	0.289	60.42
02	0.777	3.74		4,421	0.550	214	0.328	0.283	67.17	0.392	56.27
03	0.802	3.65		4,080	0.569	211	0.334	0.247	67.40	0.328	58.10
04	0.825	3.61		5,000	0.531	226	0.318	0.254	62.90	0.278	60.38
05	0.883	3.58		4,380	0.129	235	0.316	0.207	69.30	0.272	60.81
06	0.790	2.61		4,219	0.636	189	0.329	0.262	67.69	0.351	58.29
07	0.555	3.50		4,240	0.569	213	0.333	0.263	67.47	0.396	53.65
08	0.883	3.61		4,350	0.109	195	0.324	0.203	69.59	0.270	60.80
10	0.821	3.70		4,280	0.582	213	0.324	0.178	72.21	0.263	61.78
11	0.783	3.45		4,931	0.536	213	0.323	0.229	68.24	0.308	58.68
13	0.835	3.78		4,360	0.457	195	0.328	0.225	68.96	0.291	61.08
14	0.775	3.75		4,990	0.504	206	0.337	0.268	62.32	0.294	59.75
15	0.893	3.58		4,142	0.515	210	0.328	0.251	67.66	0.332	58.54
19	0.802	3.58		4,130	0.405	221	0.333	0.257	67.00	0.335	58.40
21	0.842	3.55		4,090	0.595	216	0.330	0.212	72.24	0.293	63.12
23	0.822	3.60		4,180	0.588	209	0.332	0.203	70.33	0.269	62.18
24	0.840	3.76		4,280	0.461	197	0.331	0.235	68.85	0.301	61.26
25	0.809	3.75		4,234	0.546	214	0.324	0.178	73.11	0.262	62.59
27	0.835	3.95		4,265		223	0.326	0.191	68.89	0.246	61.11
28	0.796	3.69		3,952	0.433	191	0.336	0.229	68.94	0.305	59.89
29	0.792	3.41		3,787	0.561	205	0.325	0.253	67.95	0.339	58.53
30	0.840	3.90		4,137	0.467	210	0.339	0.225	67.90	0.293	59.44
31	0.893	3.61		4,460	0.117	206	0.324	0.209	68.71	0.276	60.15
33	0.843	3.76		4,204	0.429	216	0.324	0.238	67.71	0.318	58.31
34	0.792	3.84		4,541	0.503	214	0.324	0.224	67.90	0.295	59.06
35	0.920	4.16		3,680	0.452	202	0.355	0.470	63.71	0.700	49.60
36	0.832	3.88		4,142	0.426	209	0.338	0.234	67.74	0.316	58.21
39	0.860	3.59		3,728	0.488	201	0.334	0.251	67.14	0.326	58.77
41	0.893	3.65		3,450	0.110	200	0.318	0.201	69.41	0.266	60.72
42	0.772	3.74		4,083	0.549	222	0.332	0.212	69.48	0.269	62.28
43	0.828	3.60		4,166	0.532	216	0.324	0.266	67.04	0.358	57.24
44	0.819	3.69		4,330	0.569	222	0.327	0.171	73.05	0.250	62.75
48	0.783	3.77		4,401	0.501	220	0.324	0.234	67.43	0.310	58.22
49	0.833	3.76		3,963	0.502	207	0.334	0.202	69.68	0.262	11.47
51	0.806	3.60		3,947	0.698	209	0.340	0.258	66.90	0.338	58.40
52	0.812	3.76		4,163	0.560	206	0.324	0.175	72.05	0.258	61.70
53	0.822	3.67		3,937	0.528	193	0.333	0.228	68.94	0.302	60.19
54	0.802	3.60		3,958	0.480	210	0.333	0.259	66.50	0.335	58.20
56	0.798	3.58		4,650	0.503	222	0.322	0.250	68.07	0.338	58.34
58	0.820	3.67		4,092	0.594	204	0.332	0.213	68.75	0.280	60.28
59	0.813	3.72		4,358	0.581	214	0.324	0.191	70.94	0.271	61.00
60	0.795	3.75		4,146	0.545	211	0.326	0.260	67.60	0.350	58.20
61	0.830	3.77		4,130	0.489	201	0.335	0.277	69.40	0.300	60.93
62	0.794	3.53		4,238	0.521	218	0.332	0.278	66.83	0.367	57.56
64	0.851	3.64		3,916	0.512	201	0.329	0.242	68.76	0.328	59.30
65	0.893	3.65		3,430	0.142	234	0.321	0.221	68.74	0.294	59.84
66	0.799	3.65		4,690	0.508	215	0.322	0.264	67.99	0.359	58.30
68	0.815	3.90		4,328	0.512	199	0.328	0.213	69.92	0.276	62.09
69	0.829	3.79		4,896	0.465	219	0.329	0.247	66.50	0.273	65.30
73	0.837	3.58		3,790	0.585	200	0.330	0.240	67.89	0.327	57.84
74	0.880	3.59		4,034	0.536	202	0.338	0.241	67.57	0.326	57.76
75	0.788	3.67		4,749	0.496	217	0.325	0.238	67.90	0.315	58.79
77	0.800	3.78		4,143	0.416	213	0.337	0.273	69.70	0.373	57.30
78	0.818	3.70		4,286	0.586	202	0.333	0.217	68.56	0.290	59.26
80	0.893	3.75		3,662	0.396	176	0.343	0.283	67.66	0.407	56.79
81	0.820	3.72		4,109	0.596	204	0.332	0.223	68.42	0.298	59.23
83	0.736	3.82		4,750	0.485	212	0.318	0.274	63.46	0.362	53.59
84	0.824	3.75		4,120	0.512	206	0.338	0.233	68.82	0.310	59.97
86	0.820	3.58		5,550	0.558	222	0.333	0.242	65.86	0.300	59.42
87	0.824	3.73		4,301	0.558	210	0.322	0.211	70.89	0.285	62.46
89	0.880	3.59		3,798	0.513	197	0.339	0.249	68.26	0.334	58.83
90	0.790	3.83		4,564	0.502	217	0.326	0.225	68.79	0.292	60.75
91	0.865	3.71		4,627	0.627	225	0.321	0.230	67.82	0.303	59.02
93	0.822	3.53		4,450	0.595	201	0.334	0.222	69.88	0.295	61.42
95	0.550	3.50		4,270	0.562	209	0.335	0.267	67.32	0.402	53.42
97	0.804	3.66		4,068	0.460	209	0.335	0.237	68.00	0.312	59.10
99	0.785	3.67		4,520	0.498	220	0.324	0.242	68.12	0.324	58.96
Average	0.826	3.67		4,211	0.499	211	0.329	0.237	68.39	0.315	58.76
Std. Dev.	0.079	0.18		510	0.131	11	0.007	0.038	2.04	0.059	6.12
Coef. of Var.	9.604	4.99		12	26.343	5	2.157	16.268	2.99	18.553	10.42

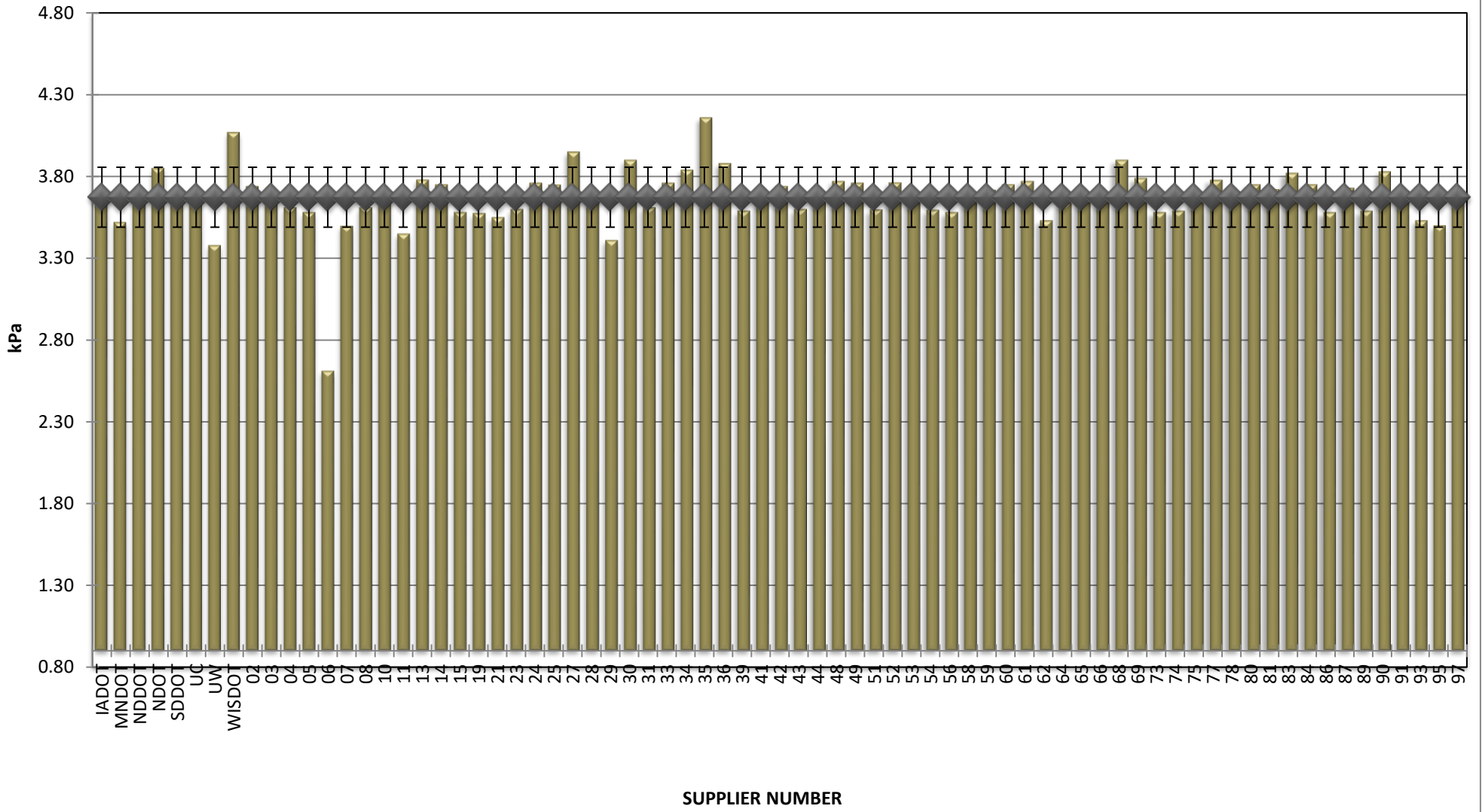
**COMBINED STATE BINDER GROUP ROUND ROBIN
SUMMARY A 2022-2
PG 58V-28**

ROTATIONAL VISCOSITY



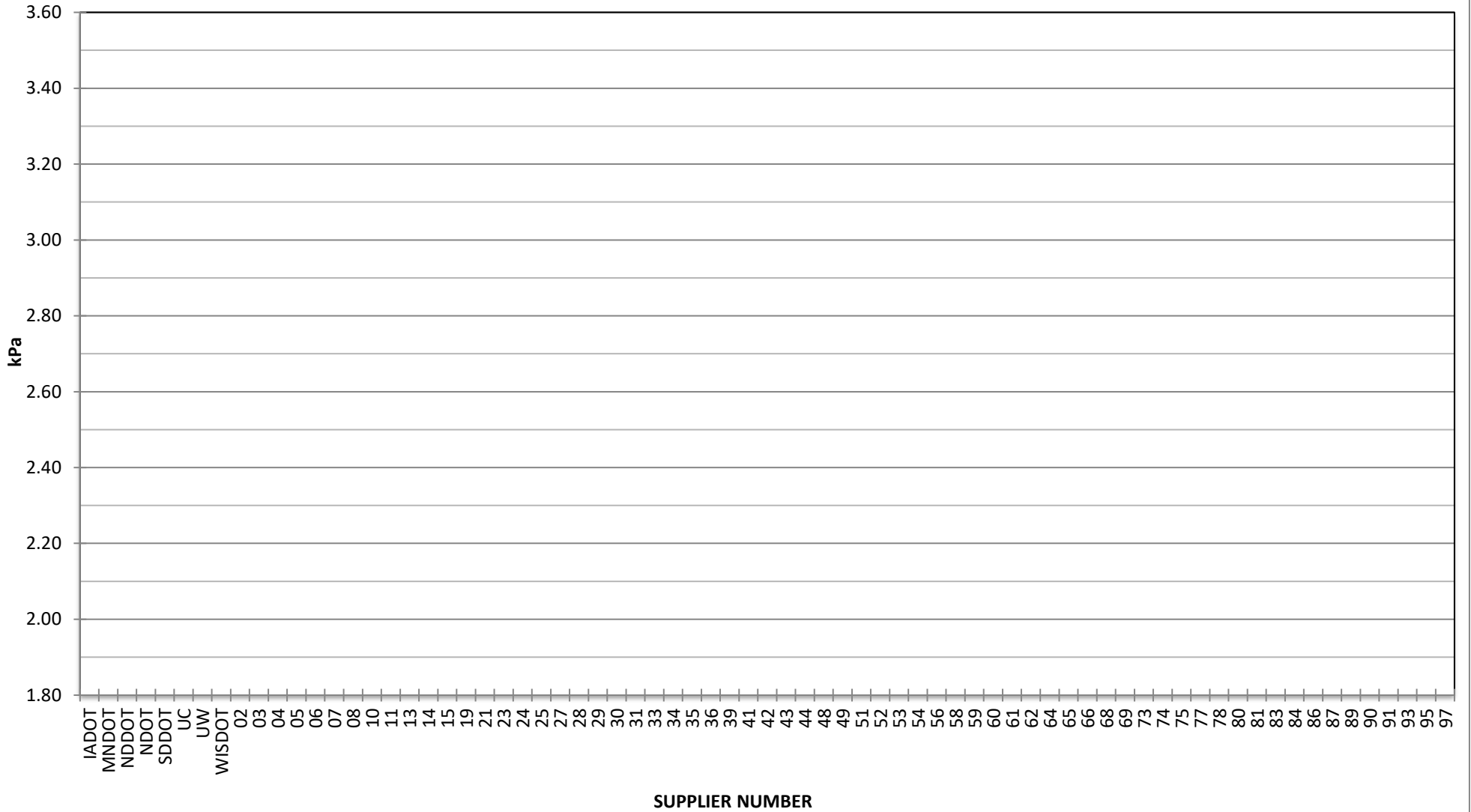
**COMBINED STATE BINDER GROUP ROUND ROBIN
SUMMARY A 2022-2
PG 58V-28**

DSR - ORIGINAL



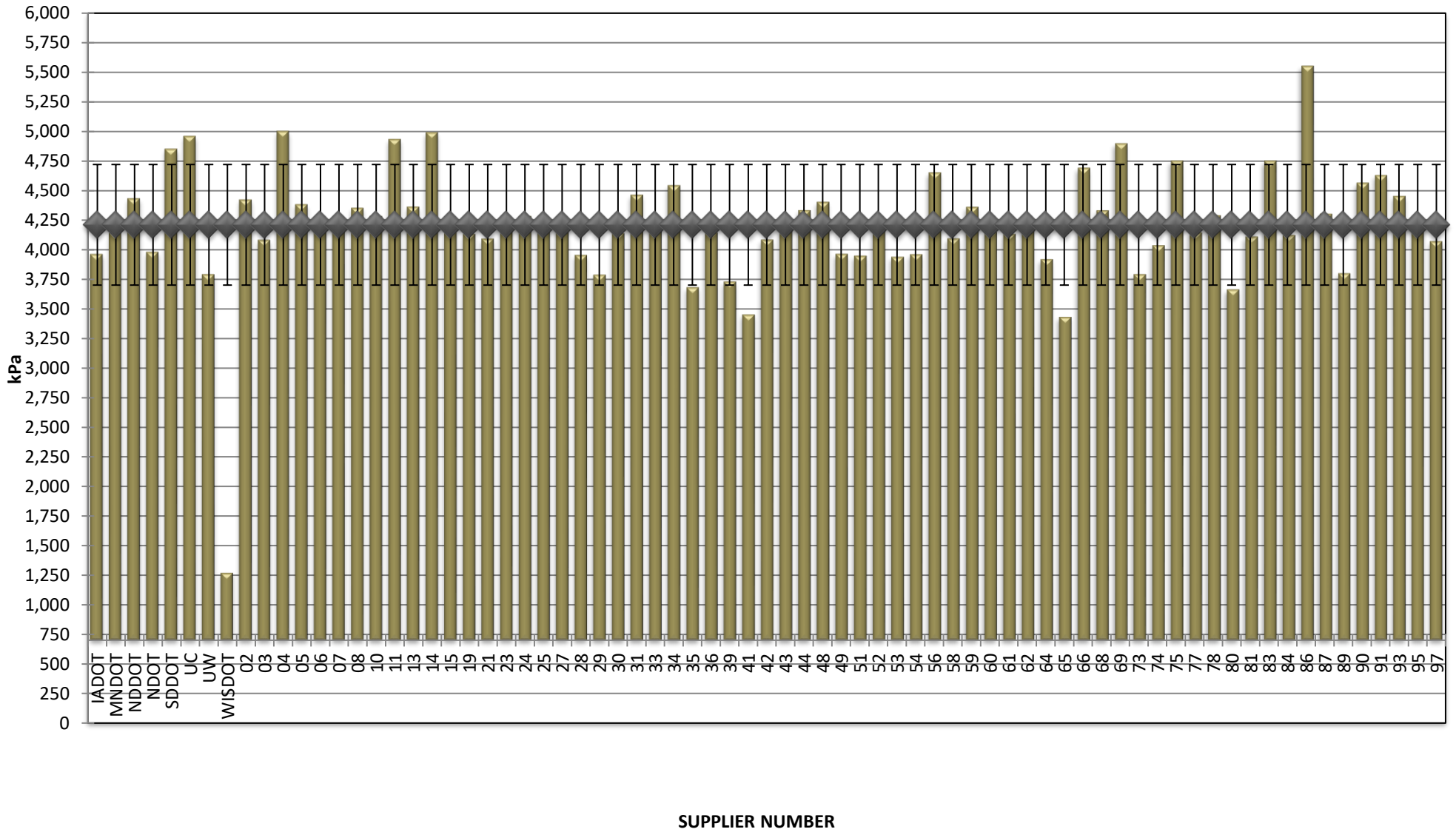
COMBINED STATE BINDER GROUP ROUND ROBIN
SUMMARY A 2022-2
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DSR - RTFO



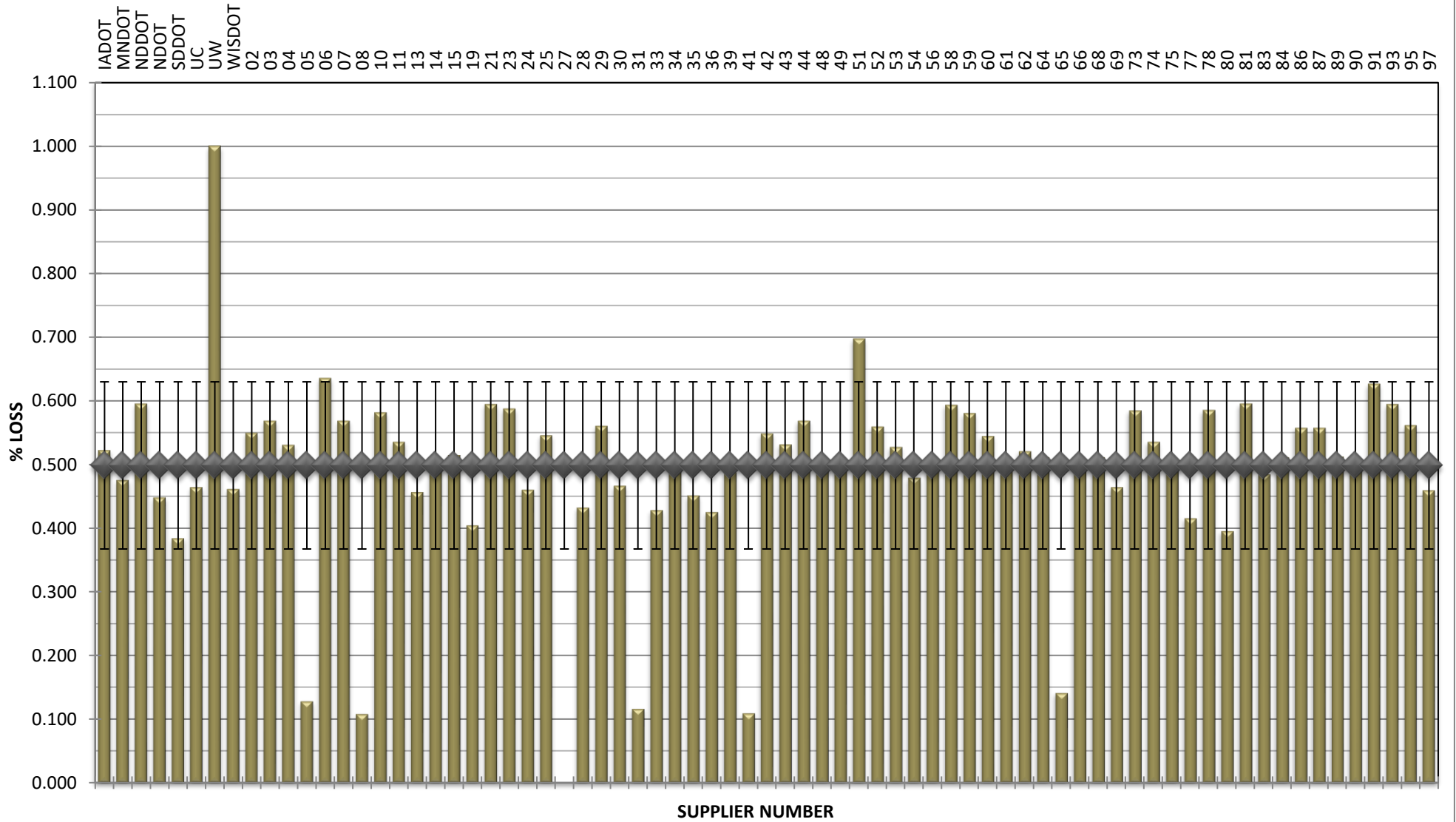
**COMBINED STATE BINDER GROUP ROUND ROBIN
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DSR - PAV



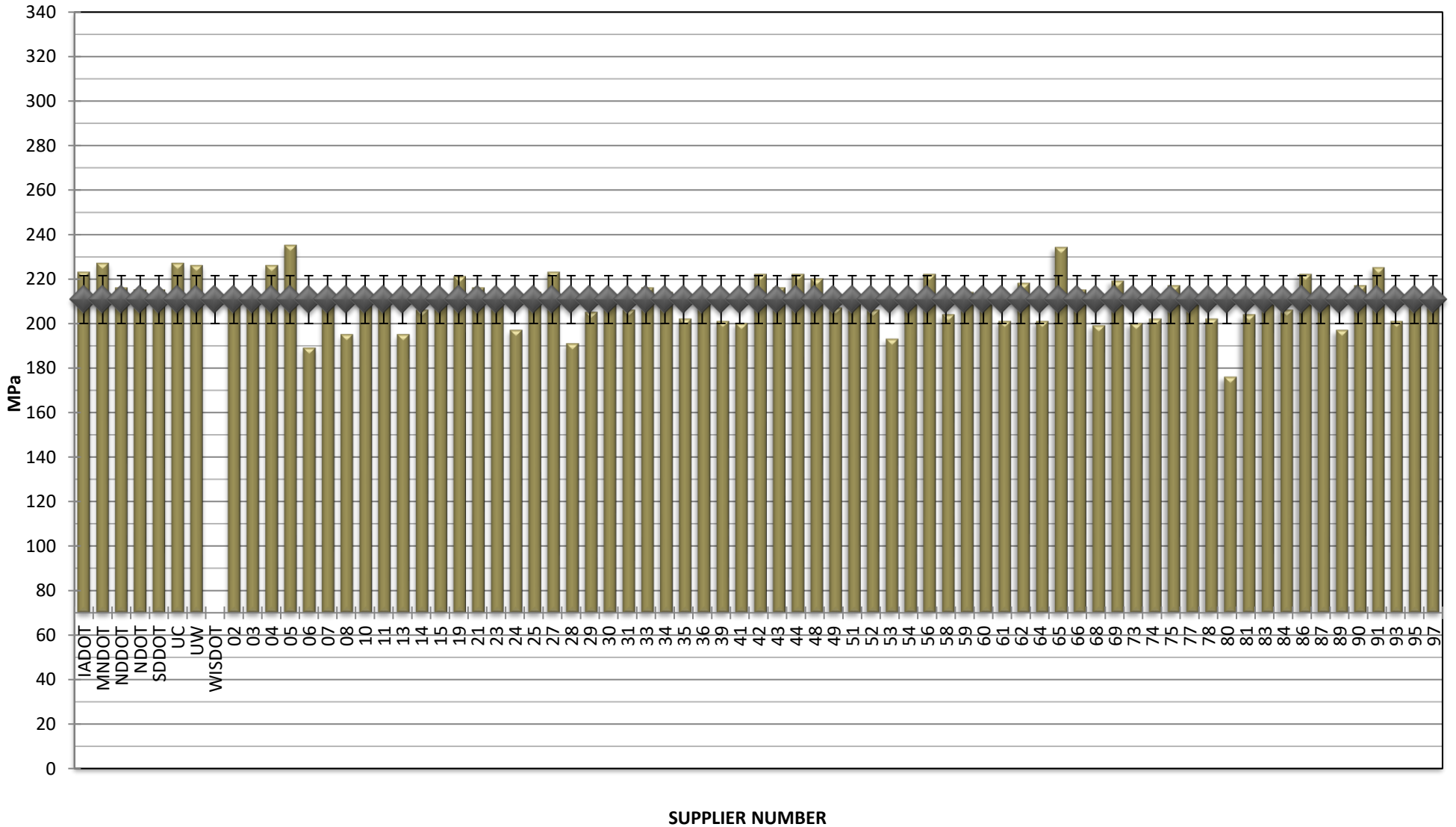
**COMBINED STATE BINDER GROUP ROUND ROBIN
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RTFO MASS LOSS



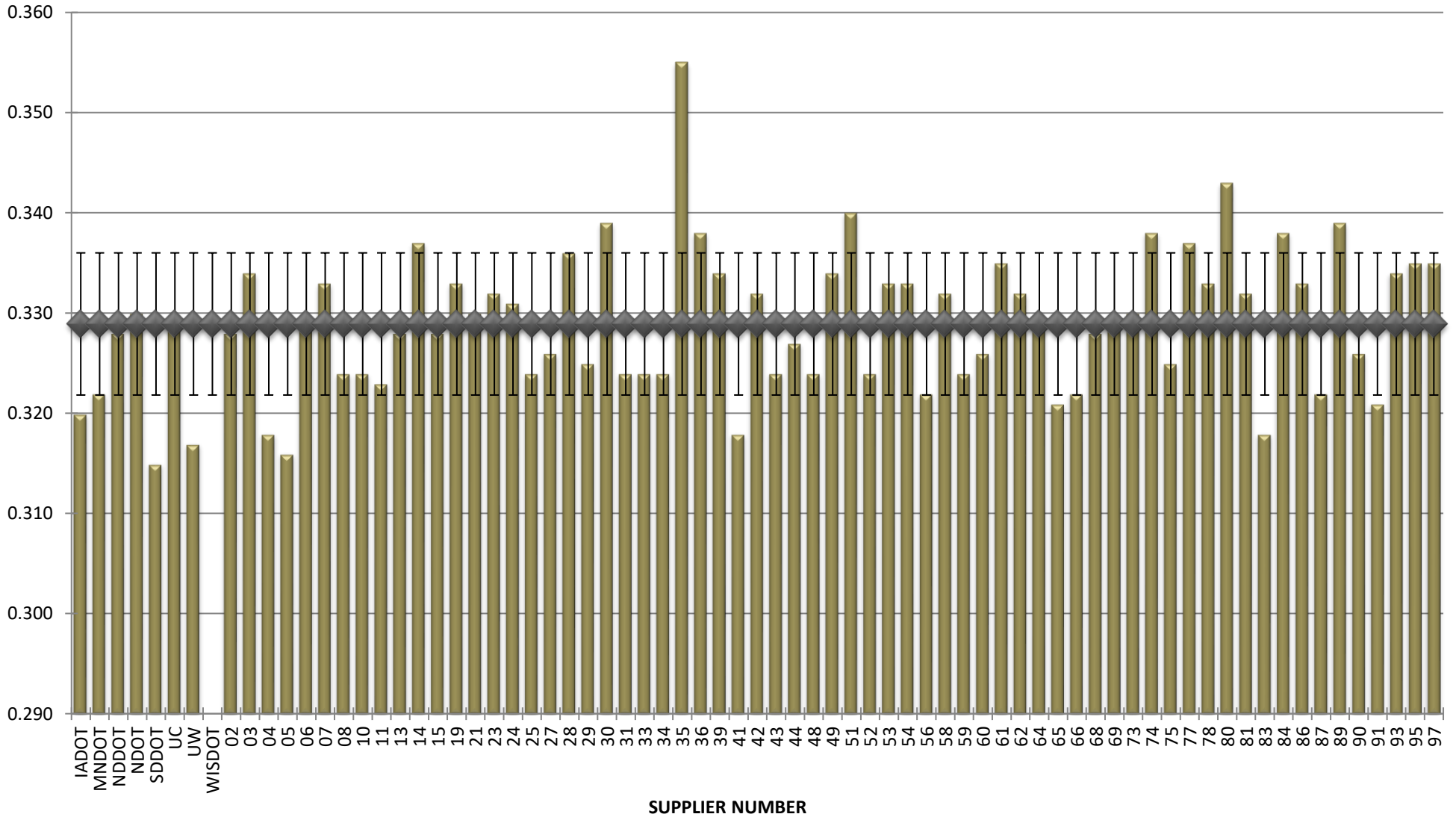
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BBR STIFFNESS



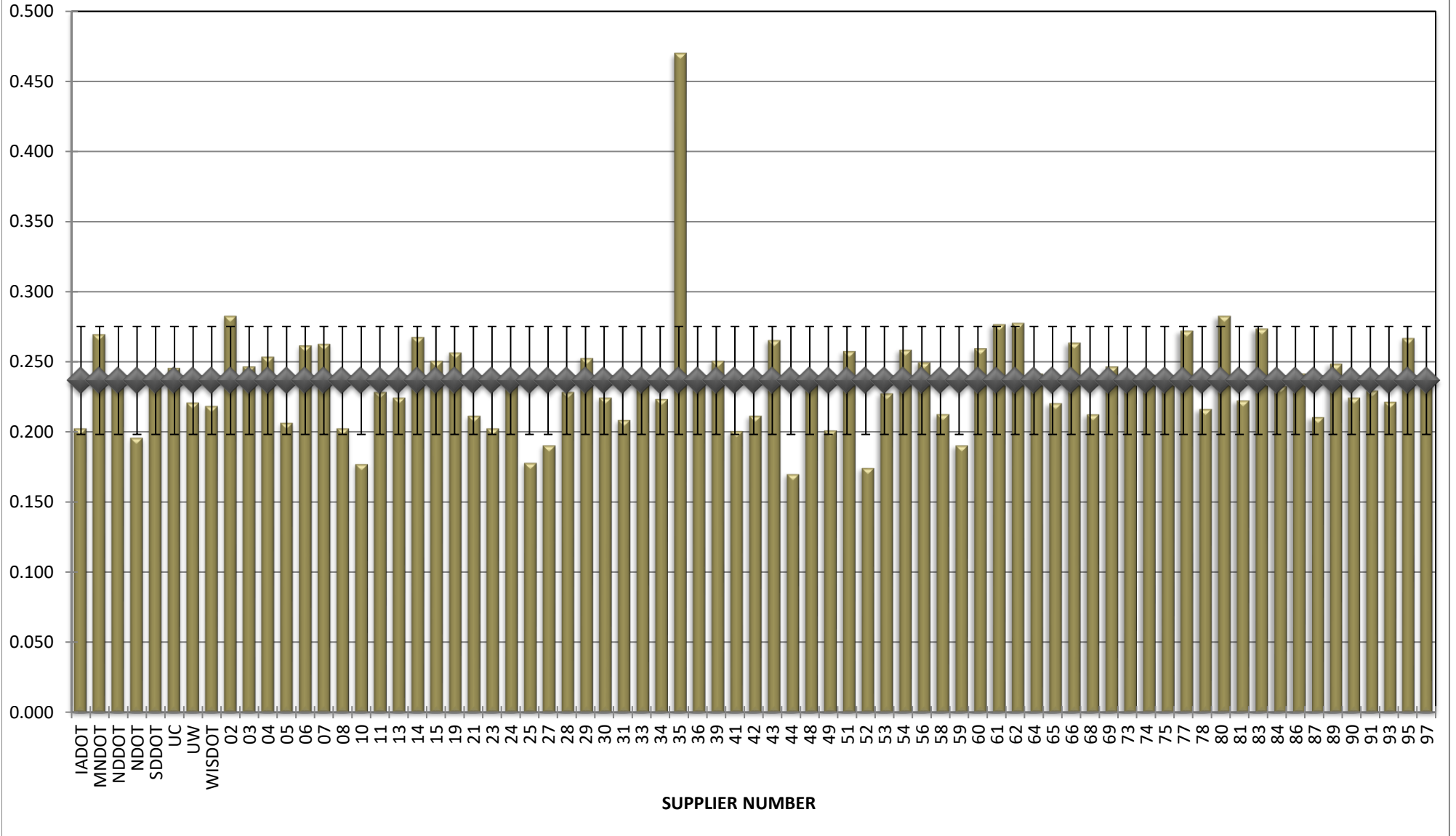
**COMBINED STATE BINDER GROUP ROUND ROBIN
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BBR m-VALUE



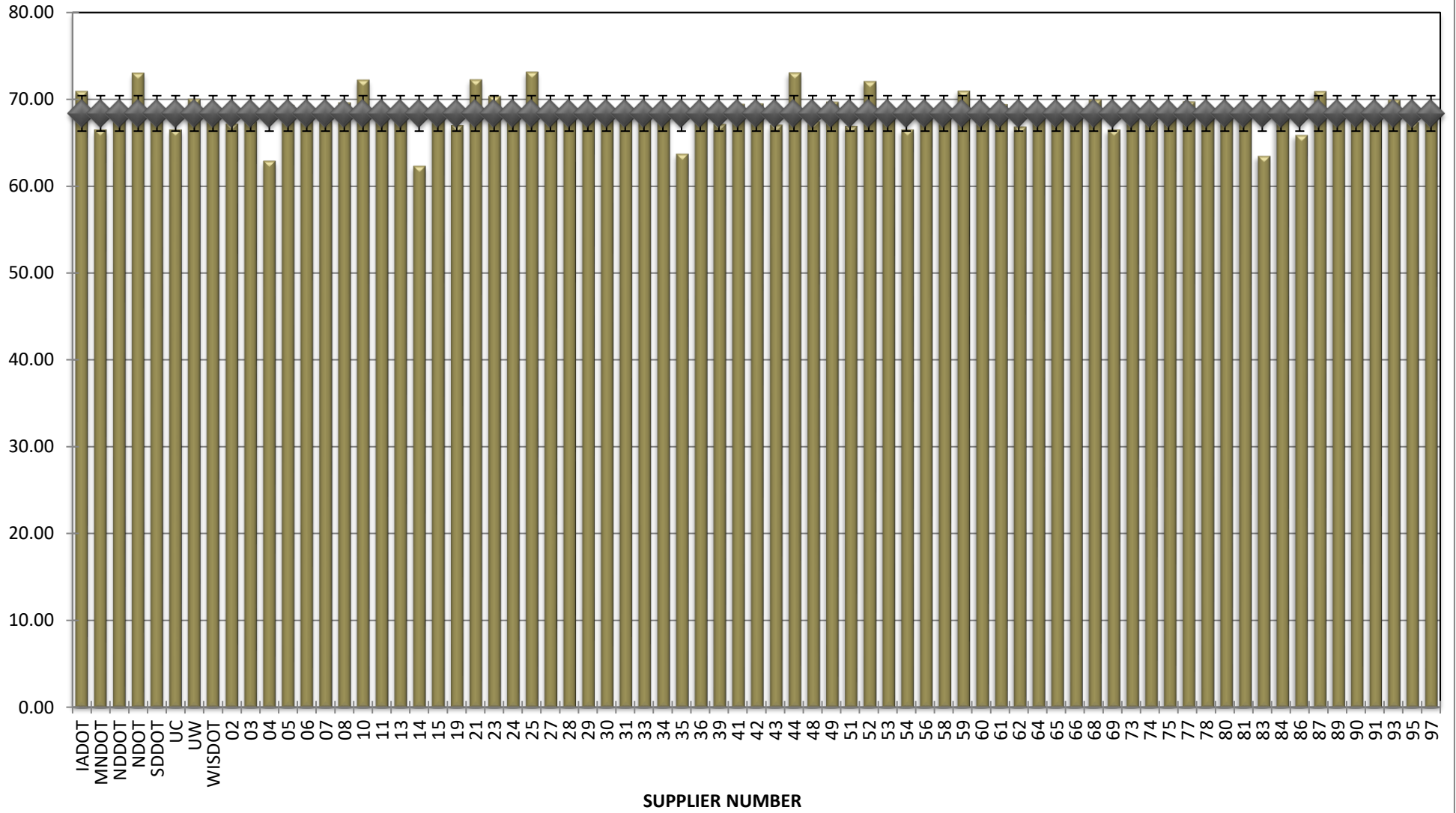
**COMBINED STATE BINDER GROUP ROUND ROBIN
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Jnr @ 100 Pa



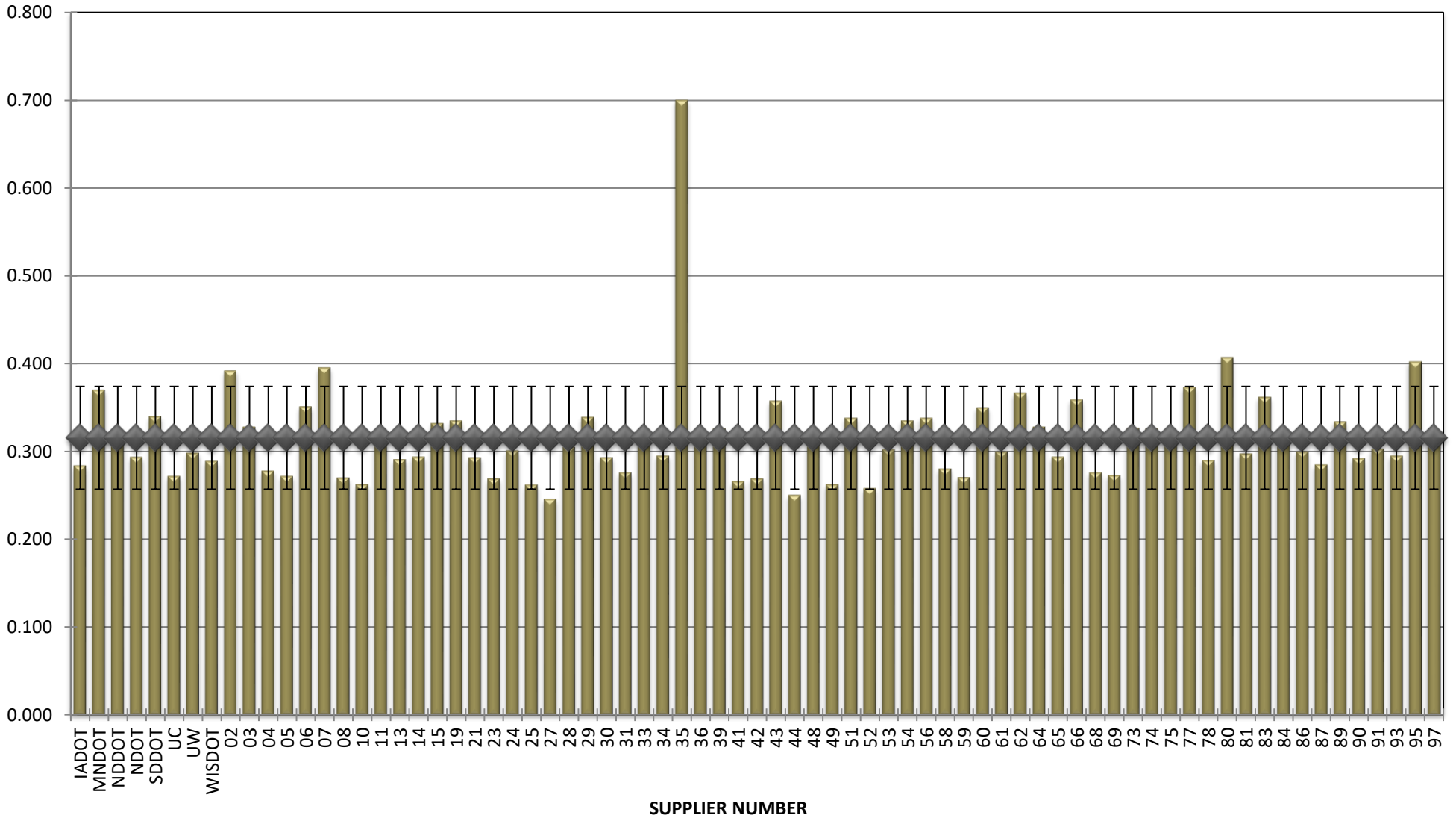
**COMBINED STATE BINDER GROUP ROUND ROBIN
SUMMARY A 2022-2
PG 58V-28**

% Recovery @ 100 Pa



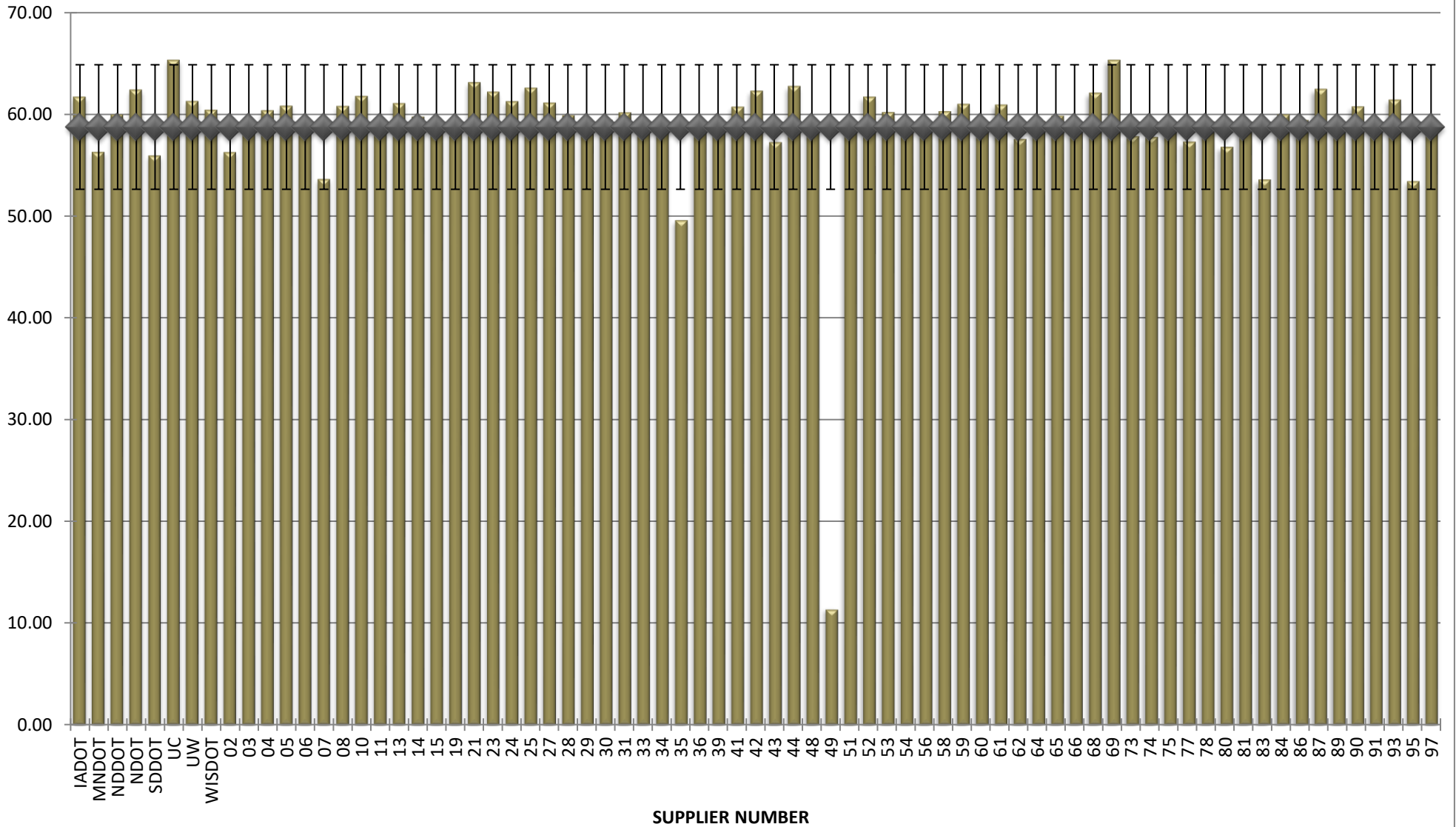
**COMBINED STATE BINDER GROUP ROUND ROBIN
SUMMARY A 2022-2
PG 58V-28**

Jnr @ 3200 Pa



**COMBINED STATE BINDER GROUP ROUND ROBIN
SUMMARY A 2022-2
PG 58V-28**

% Recovery @ 3200 Pa



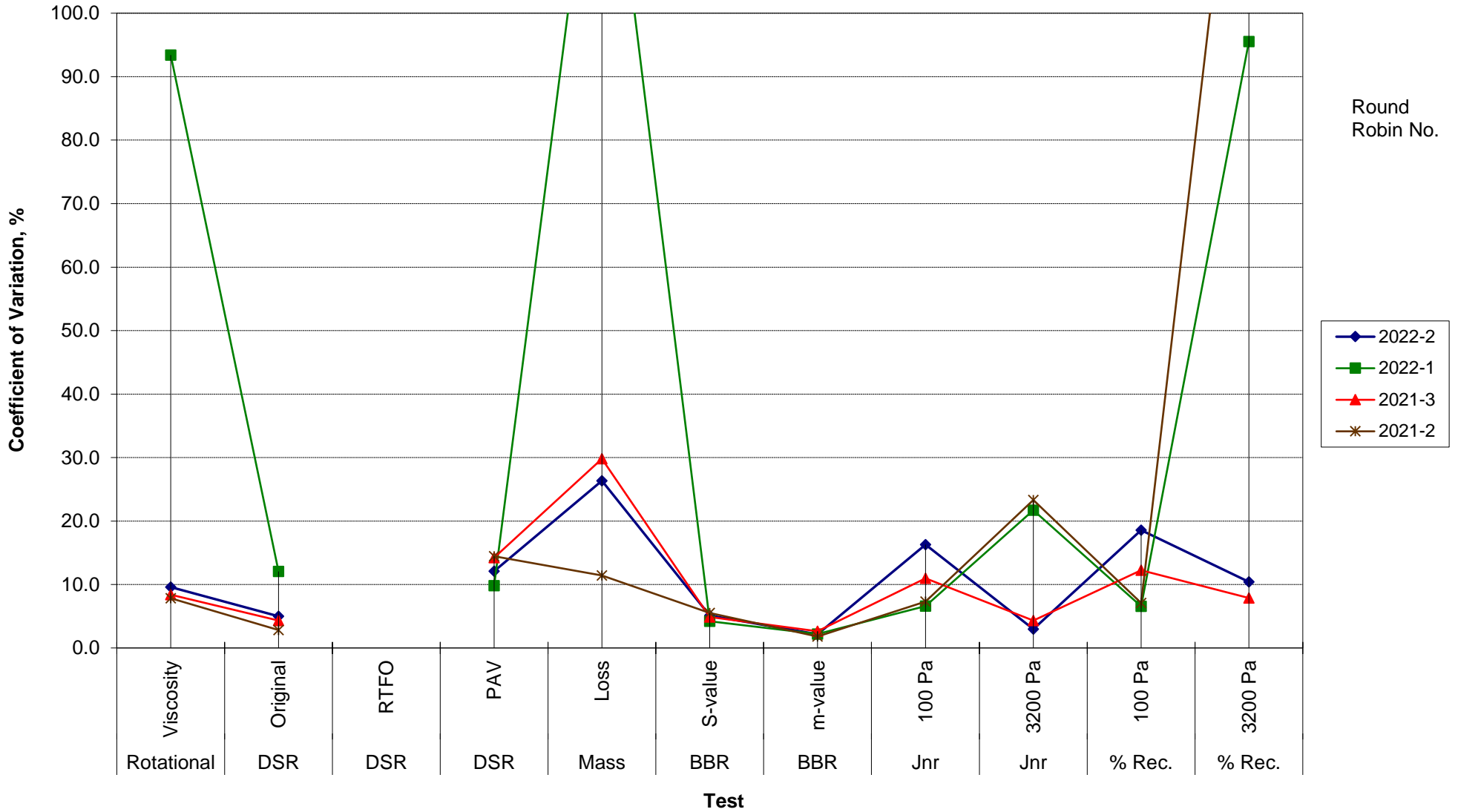
**COMBINED STATE BINDER GROUP ROUND ROBIN
SUMMARY A**

COEFFICIENT OF VARIATION

R R No.	Number of Participants	Performance Grade	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
2022-2	74	58V-28	9.604	4.988		12.101	26.343	5.100	2.157	16.268	2.987	18.553	10.419	
2022-1	72	64S-22	93.414	12.065		9.817	141.669	4.200	2.201	6.598	21.709	6.546	95.541	
2021-3	83	58H-28	8.405	4.300		14.217	29.797	4.880	2.633	10.956	4.331	12.259	7.888	23.053
2021-2	78	58-28S	7.842	2.838		14.457	11.431	5.502	1.802	7.294	23.319	7.098	152.558	74.259

**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	0.828	3.69		4,252	0.499	211	0.329	0.233	68.39	0.310	59.41
Std. Dev.	0.0384	0.1355		377.47	0.1187	10.01	0.0065	0.0273	2.0563	0.0375	2.5702
Coef. of Var.	4.637	3.675		8.878	23.817	4.738	1.963	11.696	3.007	12.100	4.326

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

COEFFICIENT OF VARIATION

R R No.	Number of Participants	Performance Grade	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	64-34	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	64-22	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	58-34	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	64-28	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	58-28S	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	58-34E	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	70-28P	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	64-22	8.1892	2.9418	6.9766	12.404	25.015248	5.960391	2.305579	15.32323	20.04762	9.000087	20.78232	38.9118
2017-3	68	58-34H	5.07204	7.8037	5.3053	16.576	12.811858	7.65849	2.261035	14.54116	3.656197	11.69038	4.017192	32.22362
2017-4	72	58-28S	7.29502	3.7618	7.1225	7.8688	13.091449	7.085242	2.138683	7.235638	29.86519	7.175334	25.32789	38.60541
2018-1	72	58-34V	6.70339	3.2264		18.537	16.120244	6.395676	2.814315	17.6796	3.240715	20.36877	4.21767	18.38078
2018-2	65	64S-22	10.2401	3.2247		8.5454	16.987038	5.301906	2.285746	13.08987	42.04845	13.138	95.94854	25.74922
2018-3	74	58-28S	7.46112	5.7239		9.7593	19.498873	6.97184	1.638225	7.07208	24.52983	11.72352	59.74421	24.22734
2018-4	64	58-34E	13.3804	2.9787		15.593	14.267542	12.49947	5.858218	372.6974	30.4146	328.5556	26.97164	54.58176
2019-1	75	58-28S	7.0211	2.9324		10.403	13.729654	5.989426	2.318013	7.221429	21.89445	7.063977	65.53669	37.34238
2019-2	74	52-34S	13.2579	4.7082		11.84	13.212726	5.854851	3.05673	53.74261	22.0569	8.043793	50.80675	20.07887
2019-3	66	58-28H	7.0285	3.7792		9.8478	17.580086	5.690624	2.23106	9.518568	3.498796	8.283841	4.539972	33.51614
2021-1	72	58-34E	16.8701	4.3597		13.354	14.980827	3.784658	1.923067	123.3285	3.154241	23.09658	2.608384	29.51648
2021-2	78	58-28S	7.84153	2.8382		14.457	11.431002	5.502305	1.802378	7.294076	23.31866	7.097866	152.5584	74.25903
2021-3	83	58H-28	8.40496	4.3004		14.217	29.797157	4.879639	2.6327	10.95622	4.330614	12.25935	7.888472	23.05315
2022-1	72	64S-22	93.4138	12.065		9.8174	141.66934	4.20015	2.200547	6.598497	21.70883	6.54592	95.54102	
2022-2	74	58V-28	9.60437	4.988		12.101	26.342994	5.099575	2.15714	16.26825	2.986543	18.55291	10.41915	

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