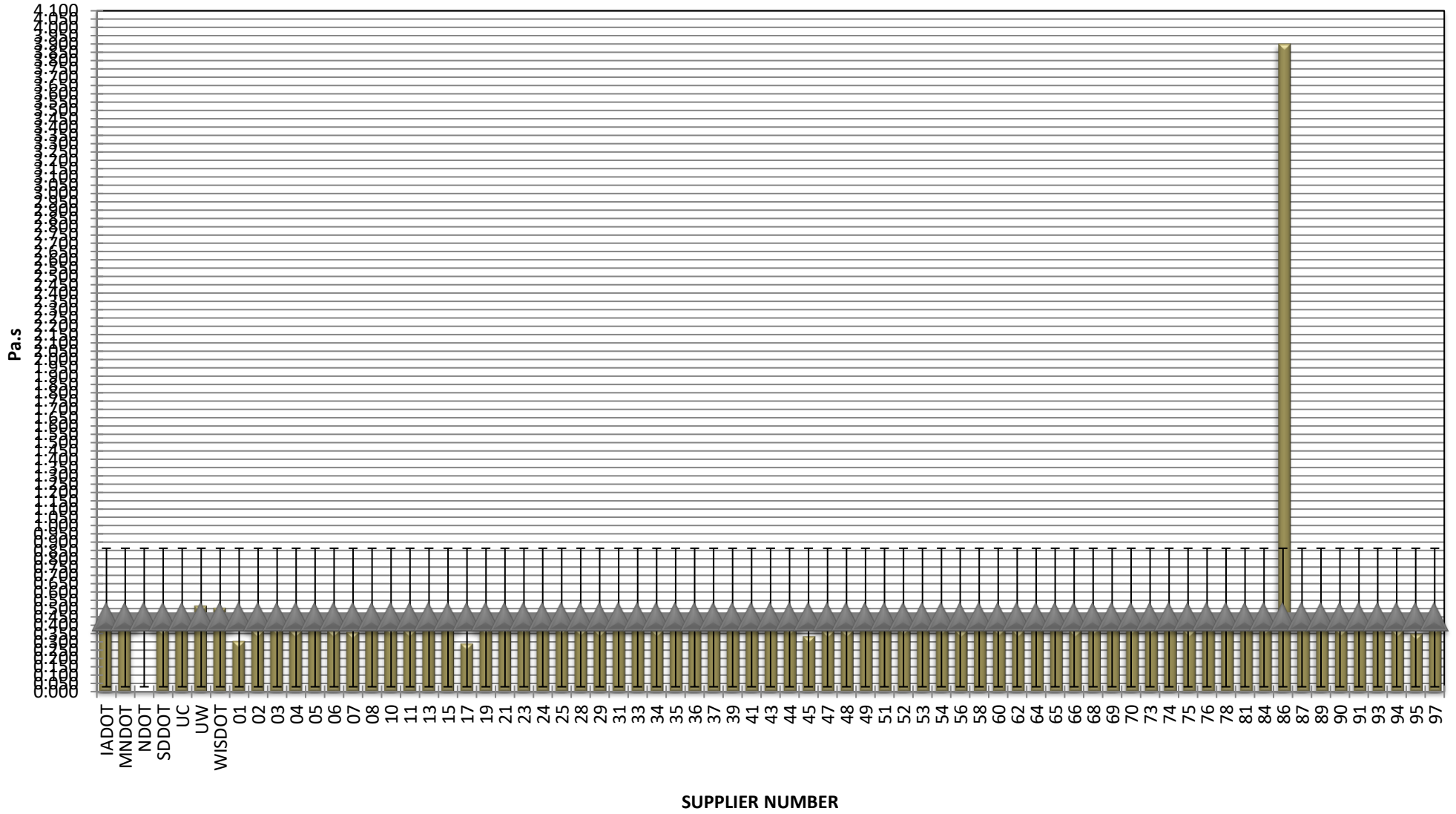


**COMBINED STATE BINDER GROUP ROUND ROBIN SUMMARY A 2022-1  
PG 64S-22**

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	0.410	1.32		4,493	0.016	185	0.314	2,600	3.60	2,940	0.50
MNDOT	0.450	1.26		3,876	0.205	177	0.307	2,877	4.46	3,233	0.24
NDOT		1.31		4,424	0.036	177	0.312	2,721	3.20	3,091	0.40
SDDOT	0.387	1.27		4,100	0.020	163	0.316	3,036	2.48	3,426	0.00
UC	0.422	1.38		4,192	0.030	192	0.321	2,720	3.30	3,070	0.40
UW	0.525	1.20		3,168	0.158	184	0.320	2,505	3.81	2,884	0.00
WISDOT	0.510	1.40		4,120	0.020	159	0.305	2,900	3.10	3,200	1.10
01	0.310	1.34		4,040	0.031	173	0.318	2,520	4.17	2,780	1.26
02	0.373	1.31		4,588	0.055	182	0.317	2,590	3.60	2,880	0.27
03	0.392	1.30		4,122	0.031	179	0.316	2,692	4.70	3,001	1.30
04	0.373	1.30		4,250	0.019	183	0.315	2,944	2.98	3,233	0.27
05	0.405	1.28		3,440	0.006	178	0.314	2,500	4.14	2,750	1.46
06	0.375	1.28		4,267	0.003	172	0.324	3,004	2.94	3,328	0.00
07	0.364	1.35		3,745	0.028	179	0.325	2,570	4.10	2,790	0.00
08	0.415	1.32		4,660	0.006	185	0.312	2,540	4.61	2,810	1.31
10	0.390	1.32		4,130	0.019	171	0.330	2,504	4.14	2,851	0.53
11	0.375	1.32		4,041	0.020	184	0.315	2,690	3.03	2,980	0.18
13	0.400	1.30		4,070	0.029	168	0.330	2,480	3.95	2,730	0.70
15	0.450	1.28		3,492	0.019	182	0.318	2,810	3.09	3,070	0.00
17	0.295	1.42		4,150	0.023	176	0.316	2,370	4.59	2,610	1.39
19	0.392	1.28		3,838	0.043	165	0.319	2,748	4.60	3,056	1.30
21	0.395	1.32		3,920	0.028	172	0.330	2,400	4.62	2,630	1.49
23	0.394	1.27		3,839	0.016	172	0.334	2,540	3.66	2,780	1.35
24	0.406	1.35		4,130	0.025	173	0.328	2,450	3.93	2,700	0.65
25	0.390	1.36		4,539	0.017	177	0.319	2,487	4.17	2,840	0.52
28	0.380	1.33		3,828	0.035	174	0.319	2,650	3.45	2,950	0.08
29	0.376	1.31		3,498	0.007	166	0.324	2,480	6.52	2,820	0.14
31	0.408	1.37		4,540	0.003	184	0.308	2,930	3.48	3,210	1.12
33	0.400	1.32		3,927	0.028	177	0.321	2,766	2.95	3,034	0.04
34	0.374	1.29		4,447	0.049	175	0.316	2,660	3.49	2,950	0.20
35	0.420	1.36		3,890	0.031	181	0.330	2,560	5.06	2,840	1.30
36	0.397	1.37		3,680	0.046	170	0.325	2,367	4.03	2,623	0.37
37	0.435	1.40		3,860	0.024	182	0.317	2,660	4.34	2,940	1.20
39	0.450	1.28		3,859	0.010	181	0.320	2,770	3.53	3,060	0.00
41	0.414	1.34		4,190	0.003	183	0.310	2,630	4.03	2,890	1.32
43	0.414	1.30		4,080	0.029	180	0.312	2,919	2.62	3,188	0.25
44	0.390	1.29		4,127	0.018	183	0.321				
45	0.338	1.41		3,970	0.035	184	0.313	2,350	4.60	2,590	1.42
47	0.370	1.26		4,350	0.024	182	0.309	2,747	3.45	3,030	0.47
48	0.373	1.37		4,436	0.003	178	0.318	2,420	5.02	2,800	0.00
49	0.412	1.38		3,630	0.071	172	0.323	2,596	2.56	2,835	0.42
51	0.400	1.30		3,957	0.048	171	0.314	2,705	5.20	3,033	1.30
52	0.389	1.30		4,152	0.019	188	0.317				
53	0.401	1.33		3,713	0.023	169	0.321	2,683	3.08	2,953	0.05
54	0.391	1.29		3,962	0.103	172	0.324	2,725	4.70	3,037	1.30
56	0.373	1.37		4,529	0.004	177	0.318	2,620	3.07	2,960	0.00
58	0.400	1.28		3,900	0.015	165	0.321	3,013	2.47	3,300	0.00
60	0.381	1.38		4,067	0.015	176	0.308	2,512	4.96	2,830	0.18
62	0.375	1.36		4,440	0.010	175	0.315	2,470	4.31	2,830	0.00
64	0.401	1.32		3,677	0.020	170	0.322	2,874	2.88	3,180	-0.11
65	0.423	1.31		4,310	0.014	177	0.310	2,370	5.16	2,630	1.47
66	0.375	1.27		4,010	0.030	173	0.325	2,270	4.54	2,530	0.59
68	0.392	1.36		3,963	0.035	175	0.324	2,644	4.10	2,928	0.94
69	0.422	1.36		4,684	0.030	185	0.322	2,692	4.20	3,078	0.50
70	0.394	1.32		4,530	0.080	164	0.315	2,620	4.54	2,890	1.23
73	0.392	1.30		3,900	0.016	174	0.334	2,530	4.24	2,770	1.33
74	0.400	1.29		3,830	0.013	170	0.332	2,563	4.40	2,889	0.12
75	0.376	1.26		4,255	0.023	175	0.324	2,940	2.87	3,250	0.00
76	0.410	1.25		2,932	0.038	157	0.333	2,830	3.11	3,110	0.02
78	0.400	1.27		4,194	0.007	171	0.322	2,933	3.32	3,254	0.00
81	0.402	1.32		4,319	0.034	173	0.326	2,819	3.42	3,138	0.00
84	0.391	1.32		4,520	0.020	189	0.312	2,552	2.74	2,779	0.41
86	3.900	1.33		3,710	0.380	180	0.326	2,630	3.06	2,840	1.18
87	0.399	1.29		4,280	0.017	175	0.317	2,810	3.90	3,120	0.42
89	0.450	0.04		2,989	0.030	173	0.321	2,750	3.10	3,030	0.02
90	0.380	1.28		4,065	0.024	161	0.327	2,680	6.45	3,120	0.04
91	0.440	1.27		4,330	0.102	175	0.320	2,770	3.17	3,080	0.04
93	0.397	1.29		3,500	0.020	165	0.336	2,620	4.29	2,890	1.26
94	0.375	1.31		3,045	0.174	158	0.315	2,740	4.24	3,050	1.18
95	0.354	1.35		3,531	0.030	176	0.329	2,590	3.70	2,790	0.30
97	0.394	1.30		3,994	0.052	177	0.315	2,692	4.00	2,941	1.30
99	0.376	1.26		4,818	0.033	176	0.325	2,610	3.87	2,910	0.24
Average	0.447	1.30		4,029	0.039	175	0.320	2,657	3.87	2,951	0.58
Std. Dev.	0.417	0.16		395	0.055	7	0.007	0.175	0.84	0.193	0.55
Coef. of Var.	93.414	12.07		10	141.669	4	2.201	6.598	21.71	6.546	95.54

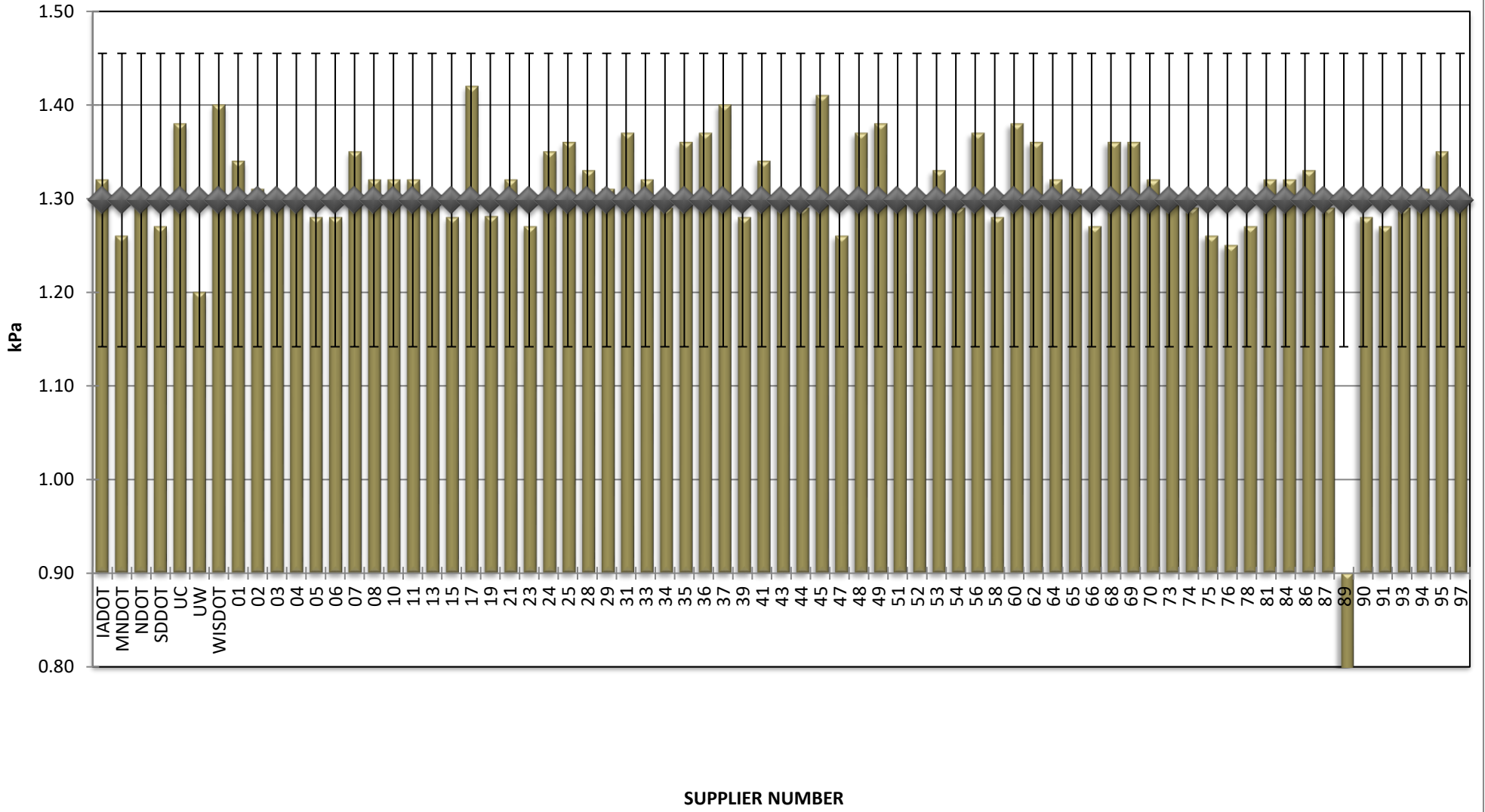
COMBINED STATE BINDER GROUP ROUND ROBIN  
 SUMMARY A 2022-1  
 PG 64S-22

ROTATIONAL VISCOSITY



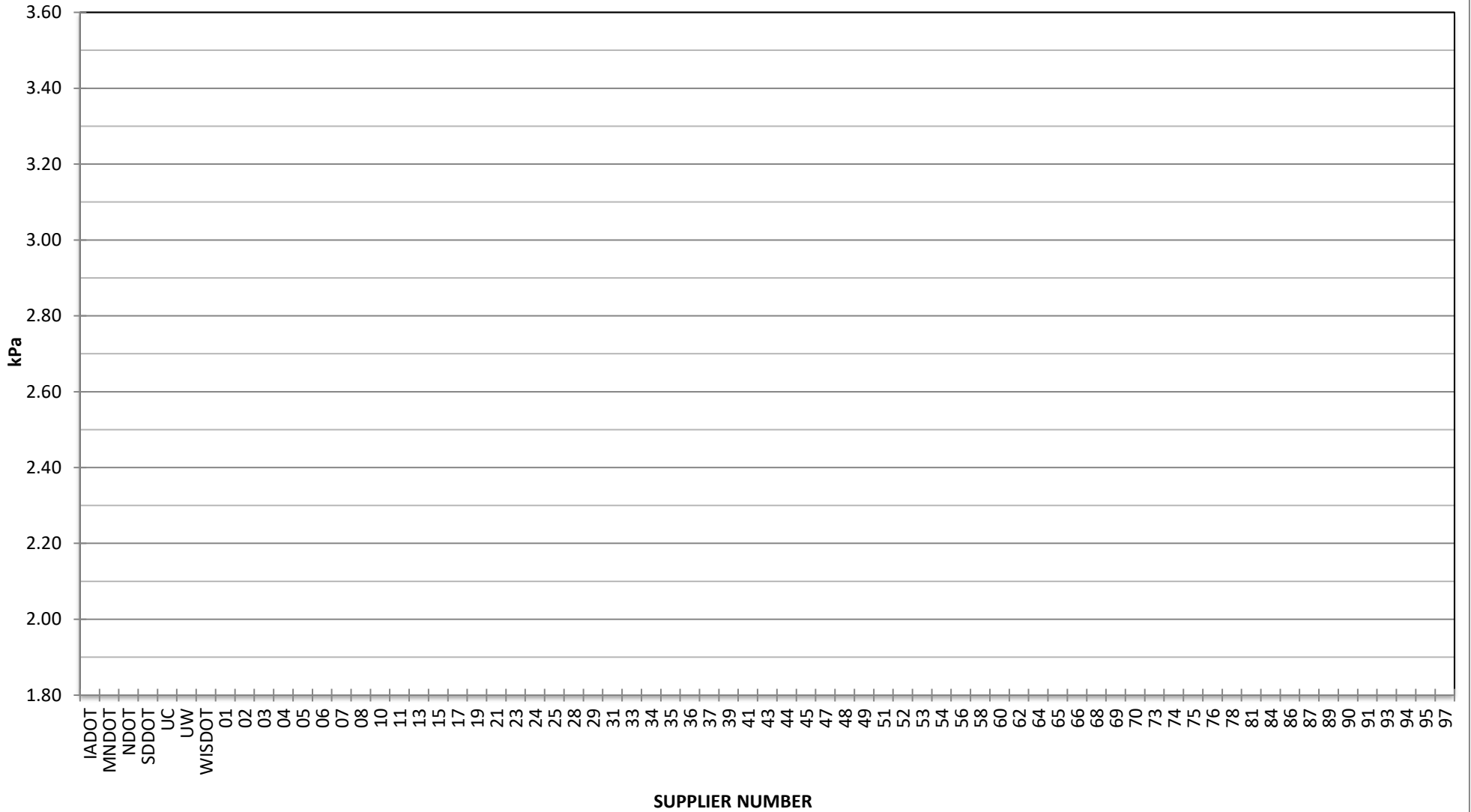
**COMBINED STATE BINDER GROUP ROUND ROBIN  
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**DSR - ORIGINAL**



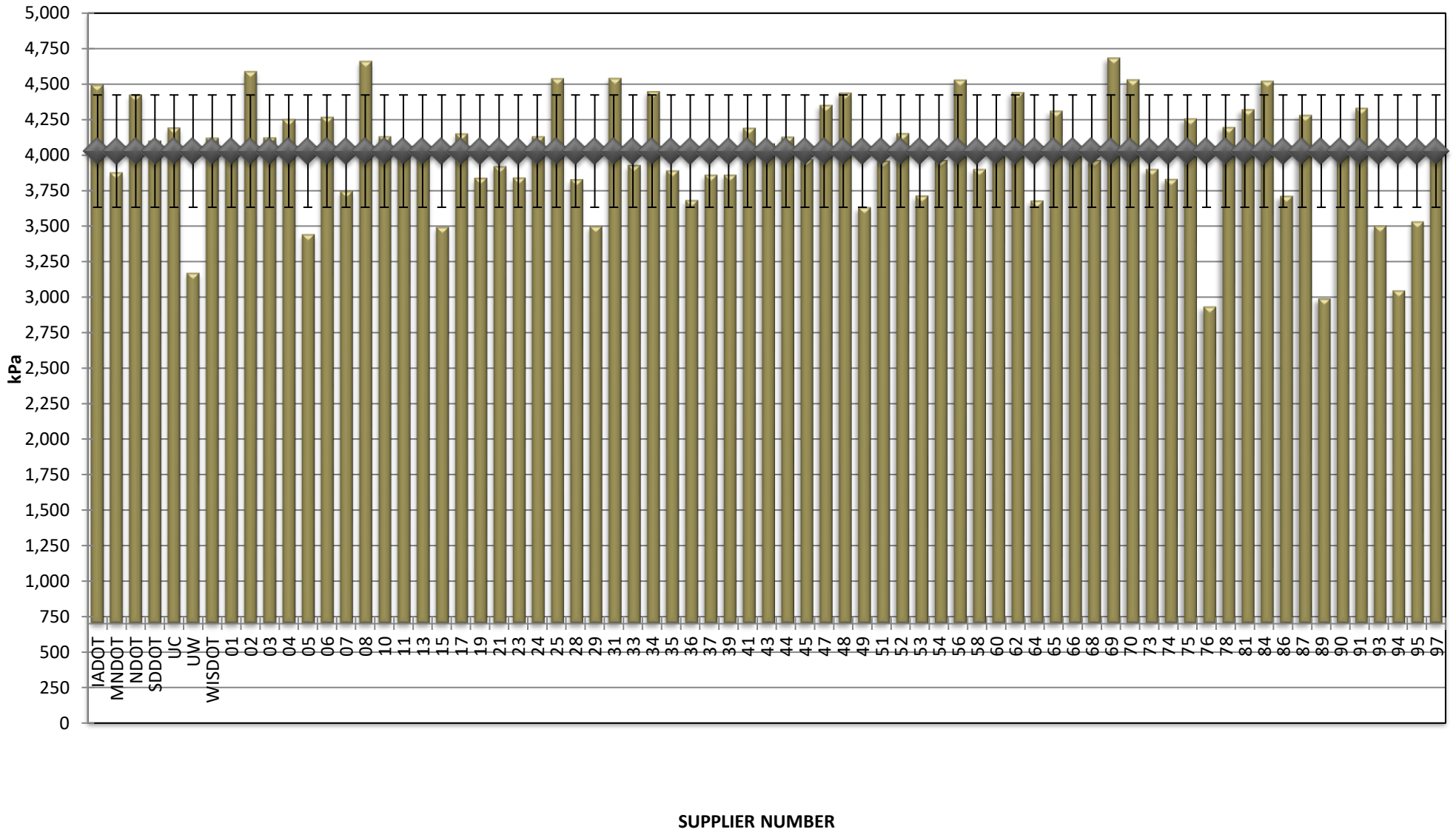
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DSR - RTFO



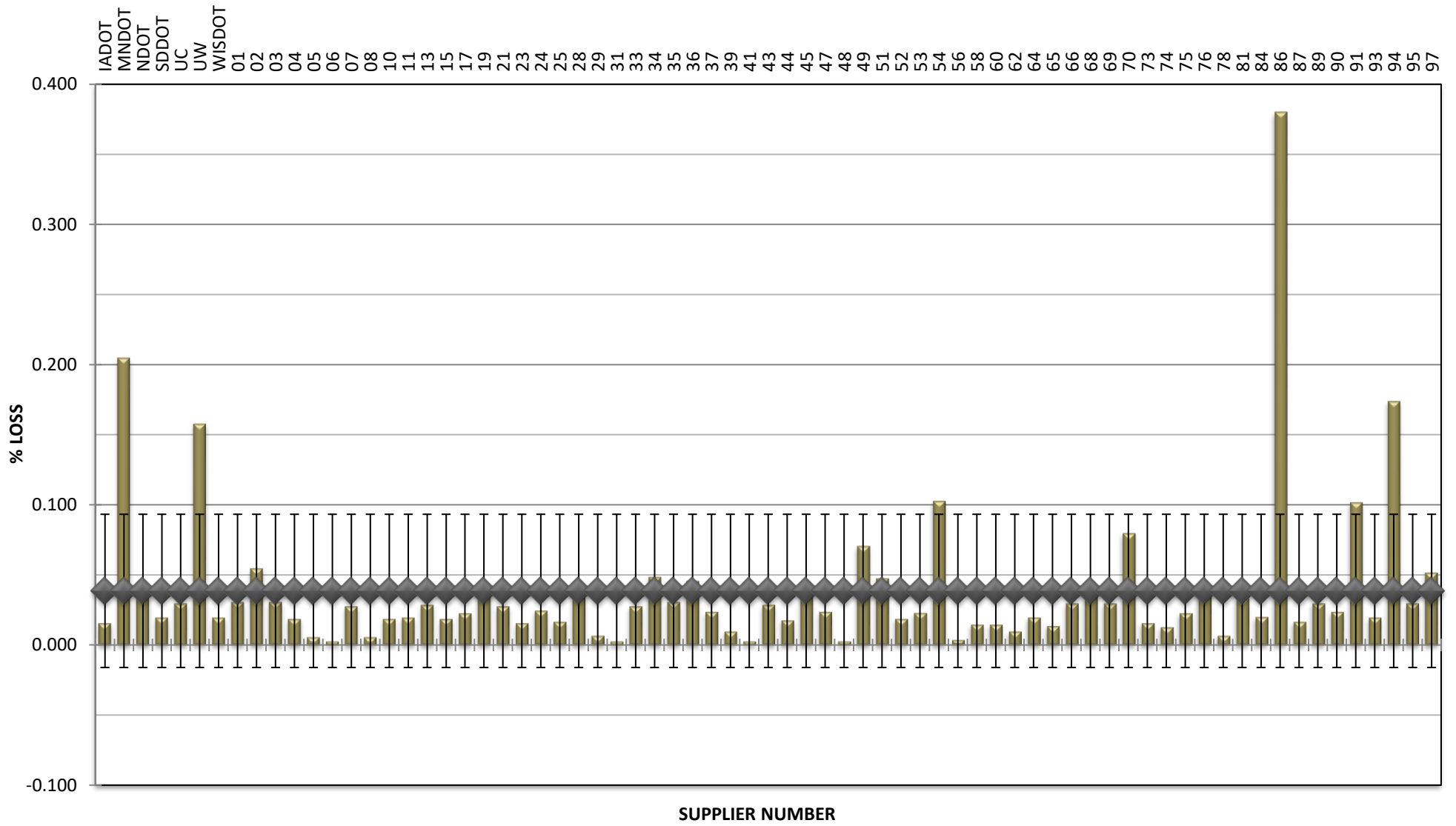
**COMBINED STATE BINDER GROUP ROUND ROBIN  
SUMMARY A 2022-1  
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**DSR - PAV**



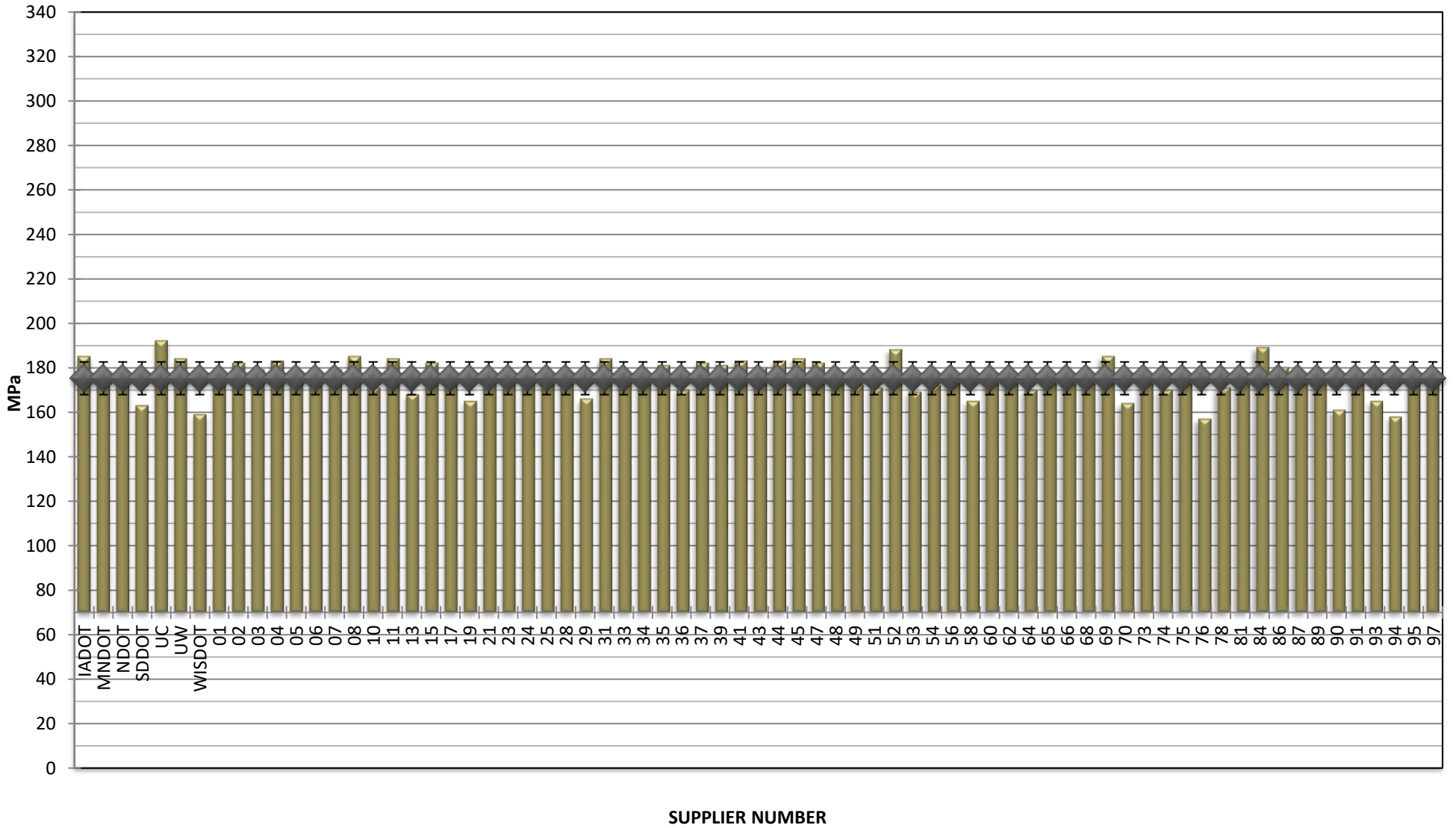
**COMBINED STATE BINDER GROUP ROUND ROBIN  
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**RTFO MASS LOSS**



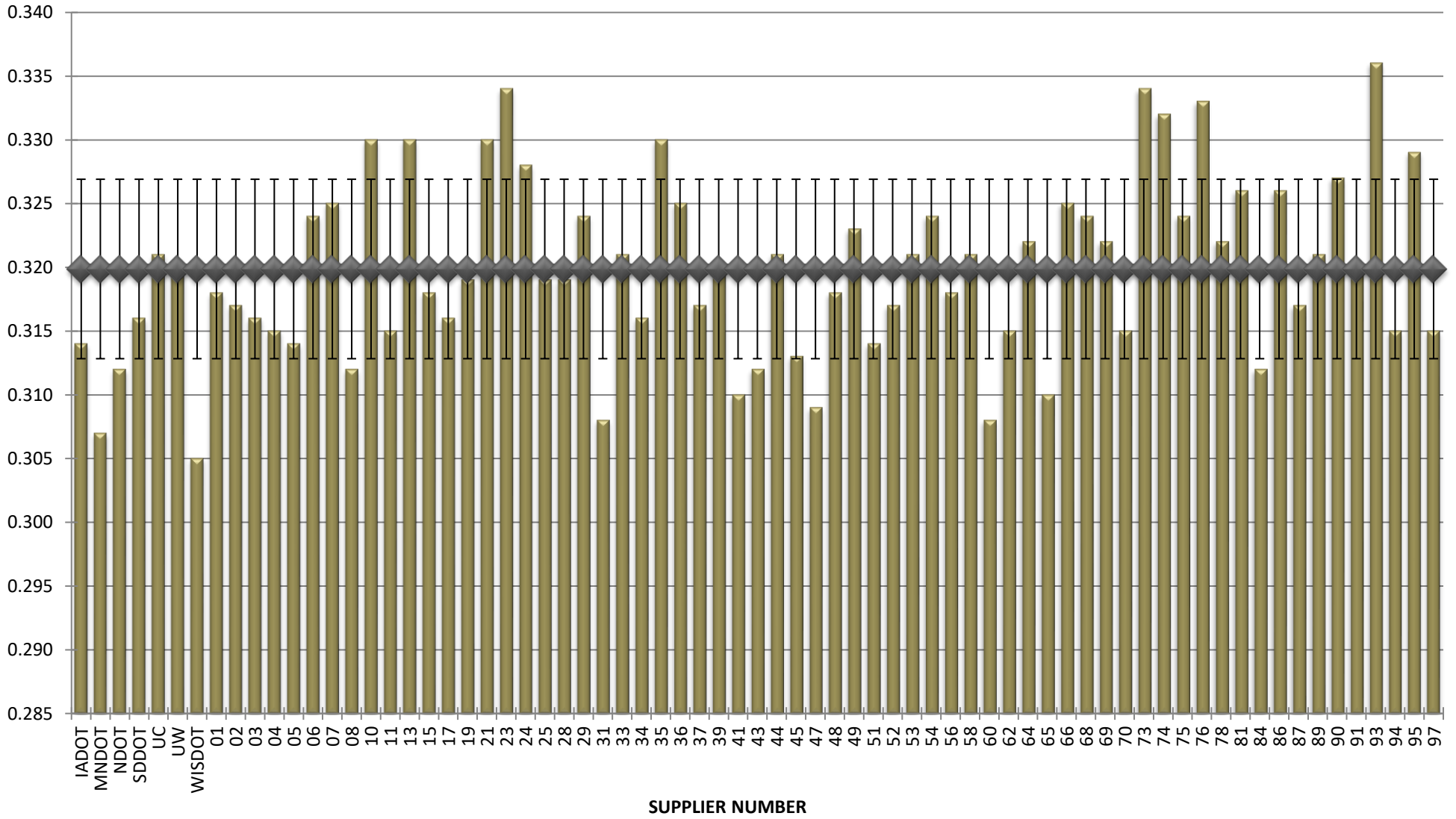
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**BBR STIFFNESS**



**COMBINED STATE BINDER GROUP ROUND ROBIN  
SUMMARY A 2022-1  
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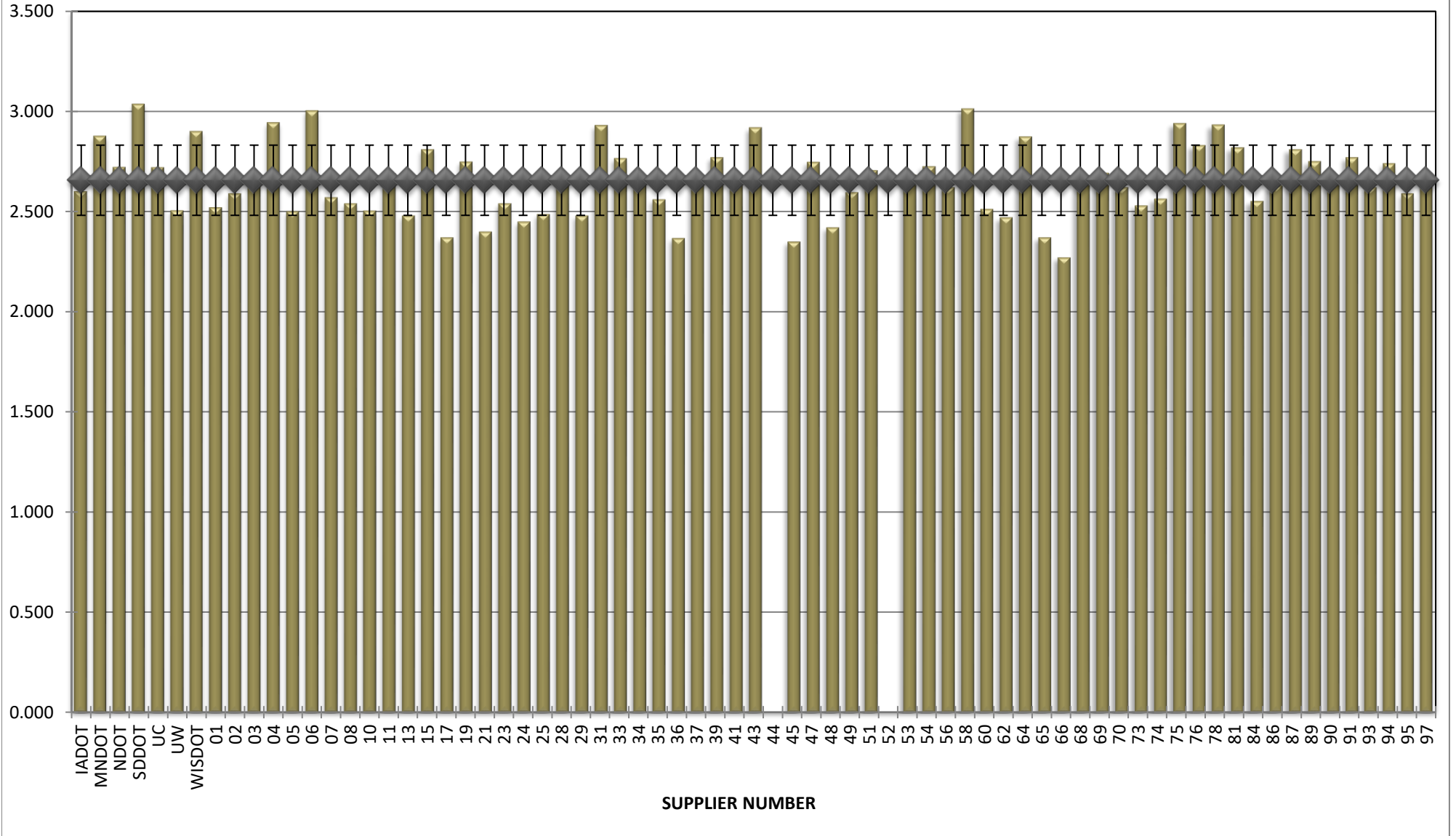
**BBR m-VALUE**





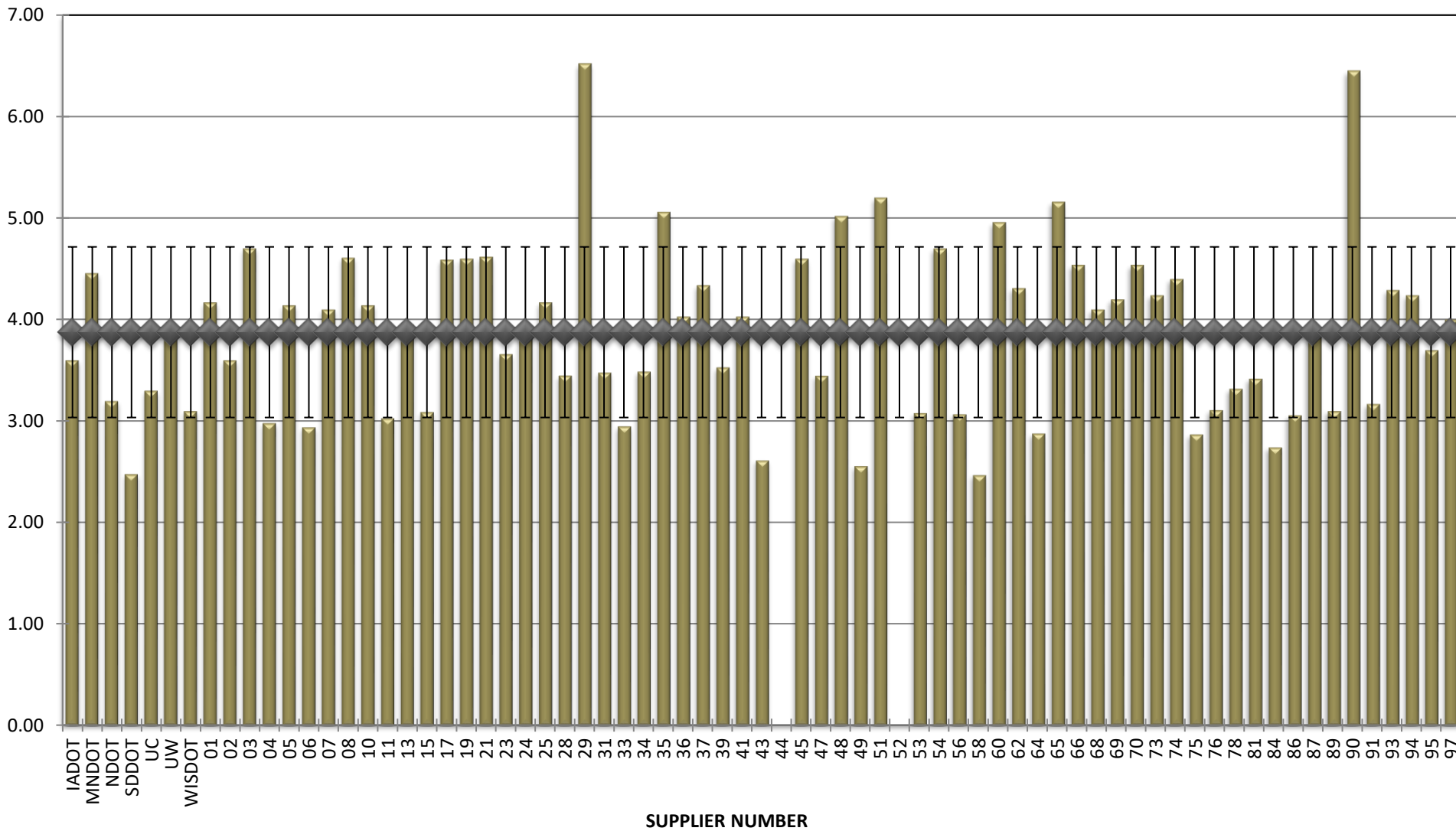
**COMBINED STATE BINDER GROUP ROUND ROBIN  
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**Jnr @ 100 Pa**



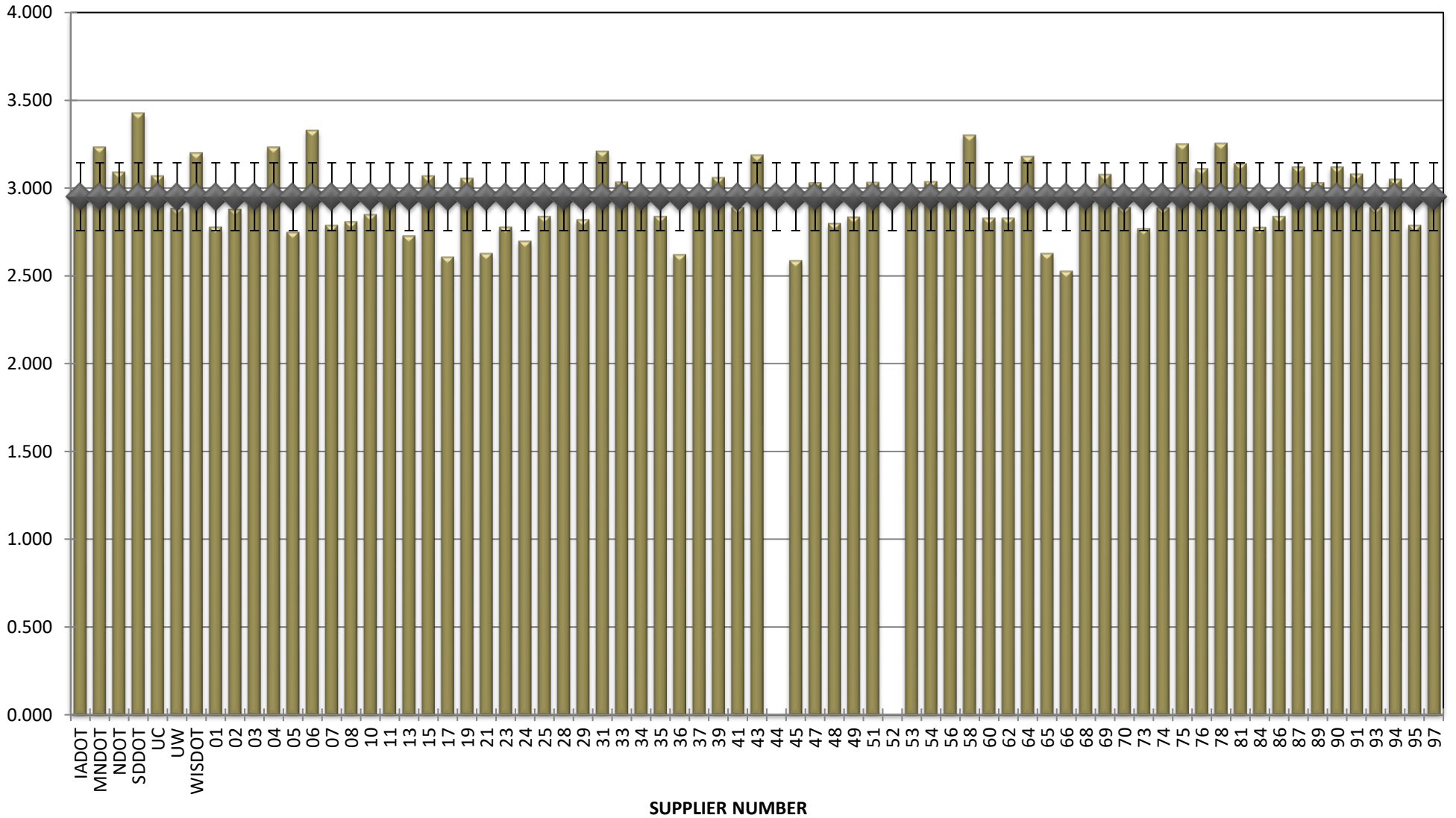
**COMBINED STATE BINDER GROUP ROUND ROBIN  
SUMMARY A 2022-1  
PG 64S-22**

**% Recovery @ 100 Pa**



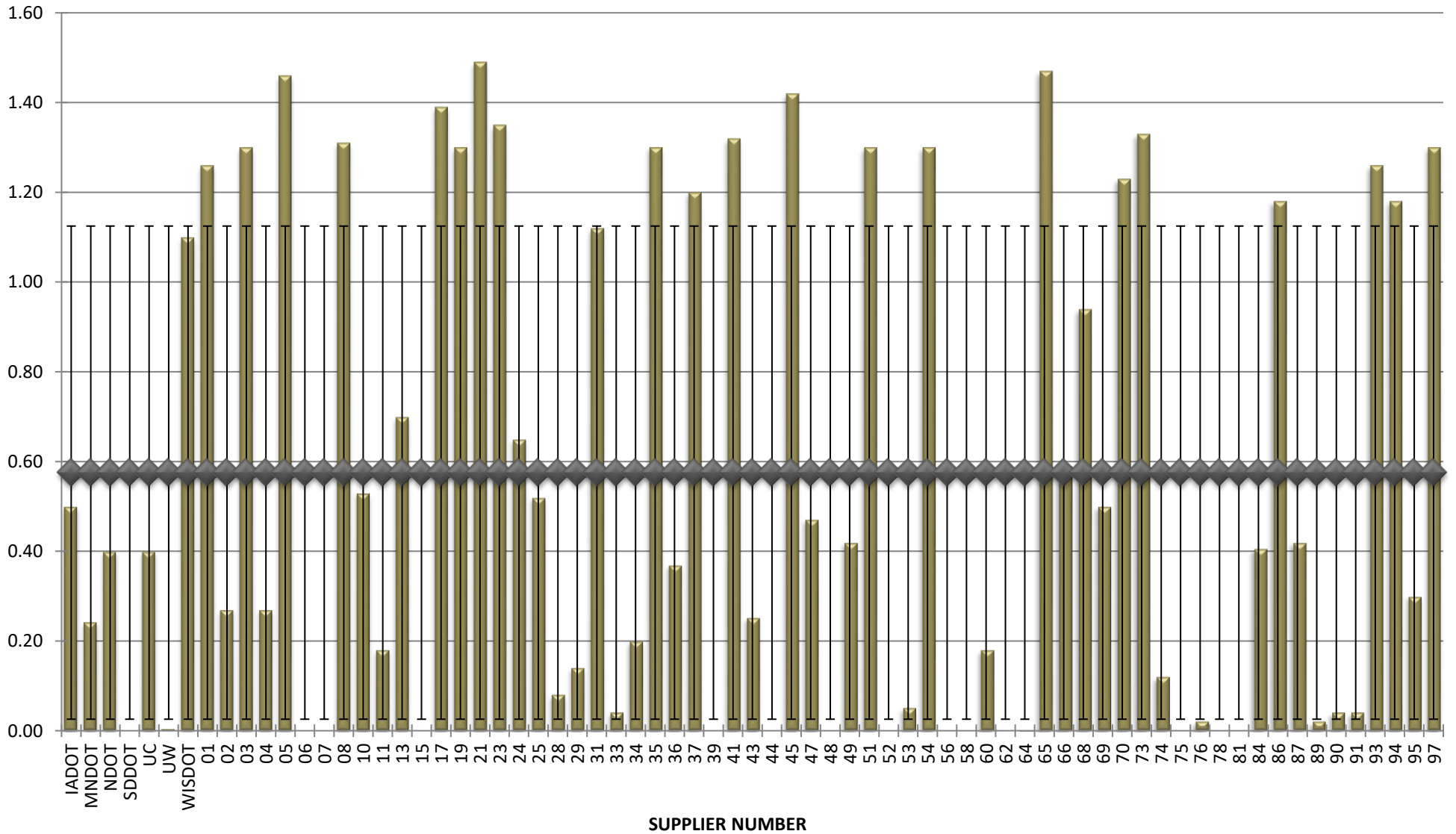
**COMBINED STATE BINDER GROUP ROUND ROBIN  
SUMMARY A 2022-1  
PG 64S-22**

**Jnr @ 3200 Pa**



**COMBINED STATE BINDER GROUP ROUND ROBIN  
SUMMARY A 2022-1  
PG 64S-22**

**% Recovery @ 3200 Pa**



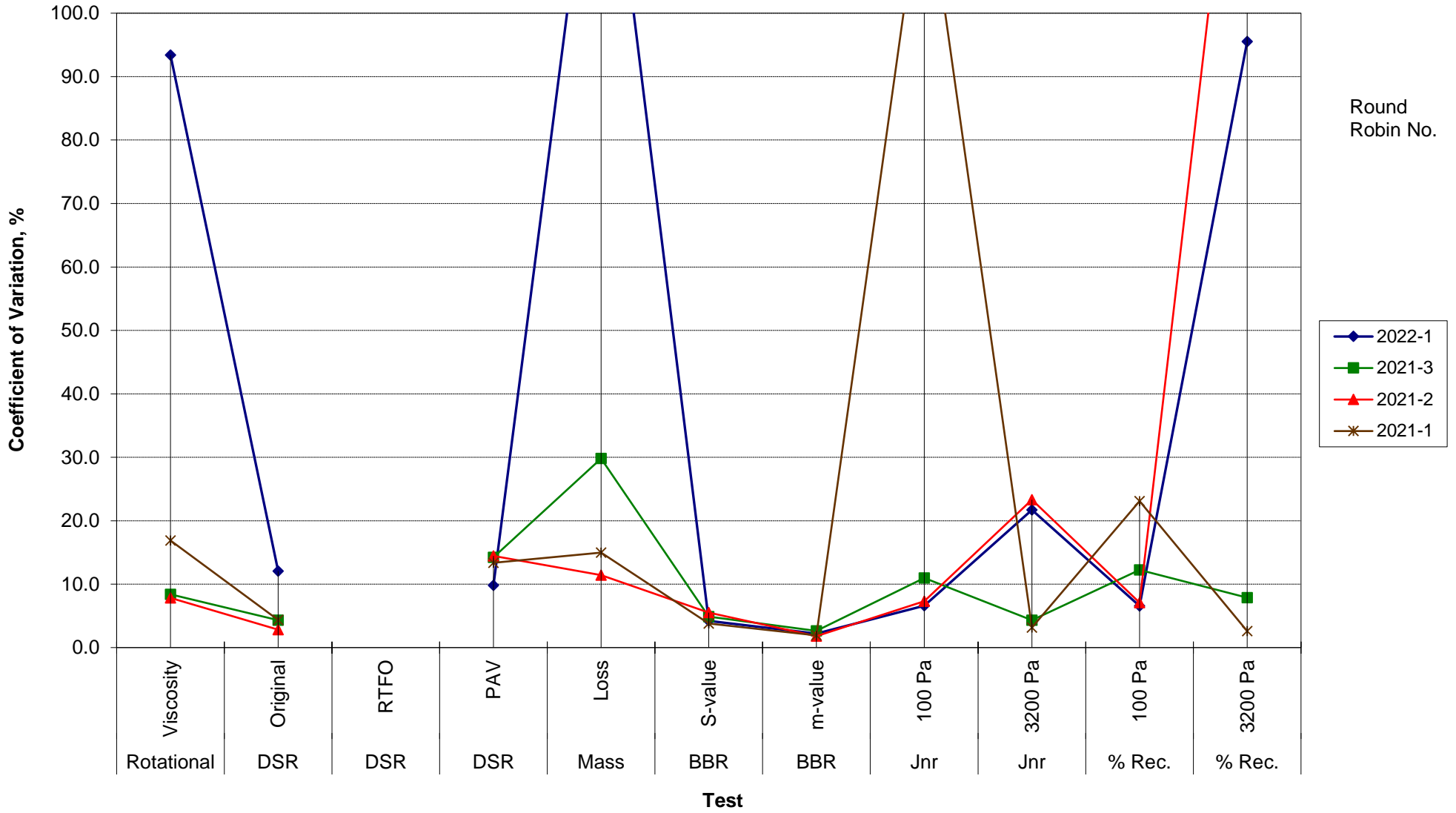
**COMBINED STATE BINDER GROUP ROUND ROBIN  
SUMMARY A**

**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
2022-1	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
2021-1	72	58-34E	16.870	4.360		13.354	14.981	3.785	1.923	123.328	3.154	23.097	2.608	29.516

**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:**

	<b>Rotational Viscosity (Pa.s) @135°C</b>	<b>DSR Original (kPa)</b>	<b>DSR RTFO (kPa)</b>	<b>DSR PAV (kPa)</b>	<b>Mass Loss (%) @163°C</b>	<b>BBR S-value (MPa)</b>	<b>BBR m-value</b>	<b>Jnr @ 100Pa</b>	<b>% RECOV. @ 100Pa</b>	<b>Jnr @ 3200Pa</b>	<b>% RECOV. @ 3200Pa</b>
<b>Average</b>	0.397	1.32		4,029	0.039	175	0.320	2.657	3.80	2.951	0.58
<b>Std. Dev.</b>	0.0585	0.0427		386.81	0.0307	7.42	0.0071	0.1765	0.7257	0.1945	0.5527
<b>Coef. of Var.</b>	14.734	3.244		9.602	79.606	4.230	2.208	6.643	19.112	6.592	96.077

**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	



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