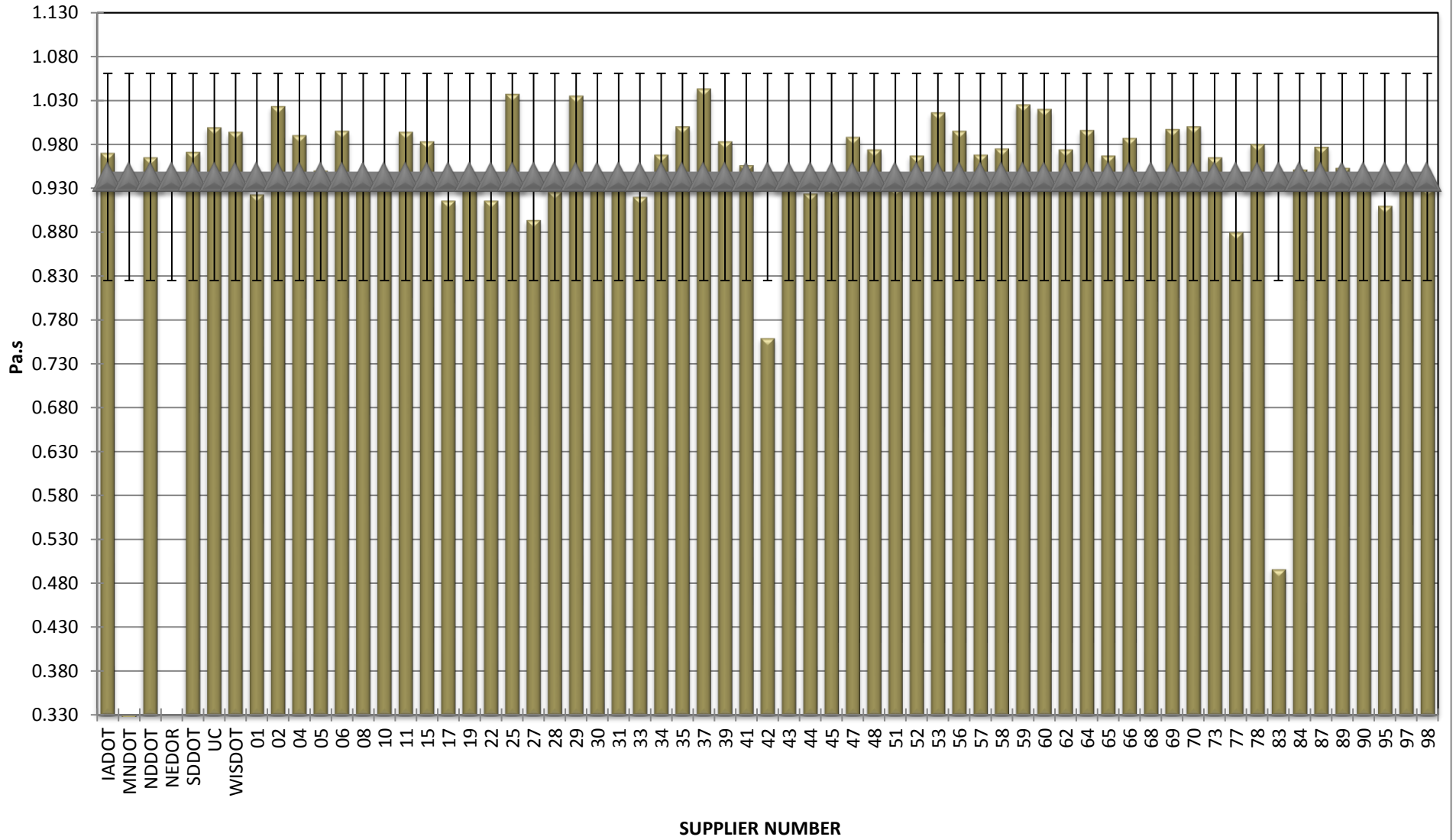


COMBINED STATE BINDER GROUP ROUND ROBIN SUMMARY A 2016-3
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Supplier Number	Rotational Viscosity (Pa.s) @135°C	DSR Original (kPa)	DSR RTFO (kPa)	DSR PAV (kPa)	Mass Loss (%) @163°C	BBR S-value (MPa)	BBR m-value	Jnr @ 100 Pa	% Recov. @ 100 Pa	Jnr @ 3200 Pa	% Recov. @ 3200 Pa
IADOT	0.970	3.07	6.630	2,180	0.507	185	0.342	0.104	87.19	0.158	80.99
MNDOT	0.220	1.80	4.190	1,300	0.482	165	0.337	0.085	88.76	0.126	83.98
NDDOT	0.965	3.21	6.870	2,145	0.564	174	0.356	0.126	83.80	0.135	83.40
NEDOR		1.92	3.990	1,552		178	0.325	0.123	84.62	0.172	81.03
SDDOT	0.971	1.79	4.080	1,510	0.425	179	0.347	0.150	81.54	0.163	81.01
UC	0.999	1.85	4.190	1,433	0.570	193	0.339	0.084	88.80	0.140	83.10
WISDOT	0.994	1.96	4.130	1,450	0.462	170	0.355	0.105	86.59	0.137	83.24
01	0.923	1.99	4.400	1,260	0.496	178	0.360	0.074	89.80	0.120	83.90
02	1.023	1.87	4.330	1,449	0.424	198	0.342	0.083	89.57	0.143	82.72
04	0.990	1.74	3.752	1,216	0.335	178	0.362				
05	0.950	1.75	4.327	1,379	0.581	185	0.346	0.040	94.21	0.106	85.96
06	0.995	2.00	4.280	1,430	0.637	167	0.337	0.089	88.82	0.143	82.89
08	0.943	1.75	4.219	1,486	0.515	180	0.344	0.045	93.72	0.114	85.34
10	0.947	1.83	4.228	1,355	0.531	182	0.339	0.061	91.51	0.126	83.93
11	0.994	1.81	3.970	1,419	0.418	198	0.349	0.082	89.51	0.141	82.77
15	0.983	3.05	6.930	2,040	0.514	173	0.352	0.082	89.25	0.128	83.78
17	0.916	2.04	4.520	1,400	0.496	178	0.352	0.071	90.00	0.120	84.00
19	0.936	1.86	4.130	1,323	0.605	179	0.356	0.095	88.20	0.135	83.70
22	0.916	1.74	4.279	1,452	0.586	190	0.343	0.065	90.97	0.111	85.48
25	1.037	1.68	3.212	2,008	0.580			0.093	88.06	0.142	82.42
27	0.894	3.16	7.320	2,040	0.510	179	0.354	0.443	76.81	0.961	55.42
28	0.926	1.75	4.100	1,339	0.434	186	0.345	0.117	84.06	0.128	83.21
29	1.035	1.84	4.240	1,280	0.520	193	0.345	0.087	88.66	0.134	83.18
30	0.935	1.85	4.090	1,343	0.416	158	0.366	0.186	77.68	0.199	76.37
31	0.933	1.74	4.289	1,438	0.587	182	0.341	0.055	92.21	0.102	86.45
33	0.920	1.75	4.250	1,430	0.448	187	0.351	0.090	88.06	0.129	83.40
34	0.968	1.90	4.090	1,470	0.475	200	0.342	0.088	88.70	0.144	82.39
35	1.000	1.79	4.320	1,430	0.506	180	0.340				
37	1.043	1.81	4.010	1,710	0.420	179	0.353	0.074	89.60	0.110	84.40
39	0.983	3.08	6.870	2,030	0.551	183	0.348	0.088	88.61	1.340	83.31
41	0.956	1.77	4.241	1,213	0.541	184	0.344	0.059	91.92	0.121	84.52
42	0.760	1.52	3.560	1,270	0.632	185	0.365	0.124	86.30	0.174	81.61
43	0.948	1.86	4.140	1,520	0.447	162	0.364	0.135	82.93	0.146	82.21
44	0.924	1.72	4.145	1,336	0.540	178	0.348	0.055	92.56	0.121	84.78
45	0.930	1.90	4.750	1,390	0.547	182	0.343	0.068	90.10	0.110	84.60
47	0.988	1.69	3.869	1,186	0.479	182	0.358				
48	0.974	1.89	4.300	1,465	0.442	195	0.346	0.081	89.02	0.128	83.42
51	0.930	1.76	4.440	1,383	0.628	187	0.356	0.081	89.10	0.113	85.10
52	0.967	1.80	4.410	1,334	0.583	182	0.349	0.056	91.92	0.099	86.58
53	1.016	1.79	4.060	1,410	0.549	196	0.346	0.137	82.86	0.138	83.26
56	0.995	1.78	3.970	1,590	0.518	203	0.341	0.080	89.66	0.129	84.01
57	0.968	1.53	3.497	1,156	0.340	177	0.355				
58	0.975	1.76	3.810	1,560	0.578	179	0.357	0.089	89.07	0.151	82.25
59	1.025	1.84	4.453	1,043	0.471			0.113	84.30	0.113	84.77
60	1.020	1.83	3.970	1,580	0.593	182	0.342	0.000	88.30	0.000	82.60
62	0.974	1.76	4.050	1,560	0.529	209	0.343	0.083	89.42	0.130	84.08
64	0.996	1.74	3.910	1,440	0.588	192	0.345	0.143	82.78	0.143	83.23
65	0.967	1.68	3.580	1,460	0.507	146	0.359	0.120	87.30	0.190	80.70
66	0.987	1.76	4.180	1,487	0.400	180	0.347	0.113	83.85	0.120	83.53
68	0.940	1.83	4.400	1,588	0.558	186	0.348	0.112	84.71	0.115	84.59
69	0.997	1.86	4.110	1,479	0.506	190	0.339	0.068	91.00	0.137	84.00
70	1.000	3.14	6.818	1,662	0.430	176	0.364	0.131	83.89	0.151	82.17
73	0.965	1.86	4.080	1,592	0.652	194	0.350	0.086	88.89	0.124	84.52
77	0.880	1.86	4.550	1,510	0.562	172	0.350	0.076	89.71	0.120	84.34
78	0.980	1.76	3.900	1,450	0.530	170	0.354	0.094	88.96	0.157	82.54
83	0.498	1.82	4.400	1,417	0.502	189	0.349	0.115	84.24	0.121	83.97
84	0.951	3.11	6.920	1,970	0.502	169	0.360	0.079	89.60	0.126	84.09
87	0.977	1.78	4.140	1,530	0.481	172	0.356	0.127	84.13	0.131	84.06
89	0.953	3.05	7.130	2,180	0.540	189	0.352	0.080	89.11	0.125	83.66
90	0.932	1.76	4.300	1,423	0.394	185	0.345	0.102	84.86	0.112	83.95
95	0.910	1.78	4.280	1,390	0.451	167	0.362	0.130	83.60	0.139	83.11
97	0.935	1.73	4.290	1,313	0.612	183	0.354	0.081	89.50	0.115	85.40
98	0.930	1.85	4.397	1,459	0.592	185	0.352	0.086	88.50	0.122	84.30
99	0.944	1.80	4.530	1,422	0.406	177	0.344	0.110	83.94	0.117	83.72
Average	0.943	1.96	4.497	1,501	0.511	182	0.349	0.098	87.59	0.164	83.02
Std. Dev.	0.118	0.44	0.967	249	0.073	11	0.008	0.054	3.54	0.190	3.94
Coef. of Var.	12.516	22.64	21.497	17	14.221	6	2.339	55.384	4.04	115.654	4.75

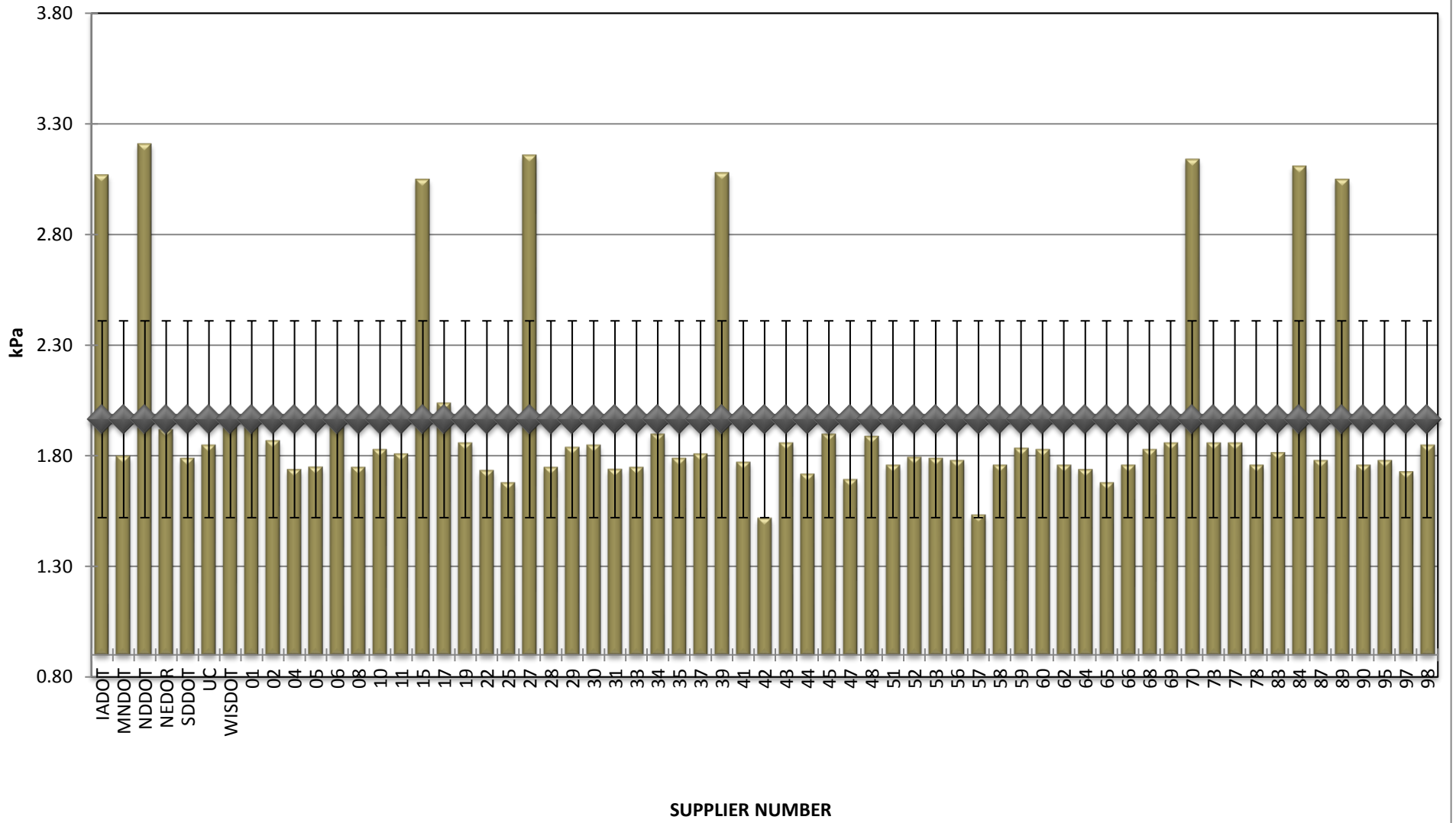
**COMBINED STATE BINDER GROUP ROUND ROBIN
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ROTATIONAL VISCOSITY



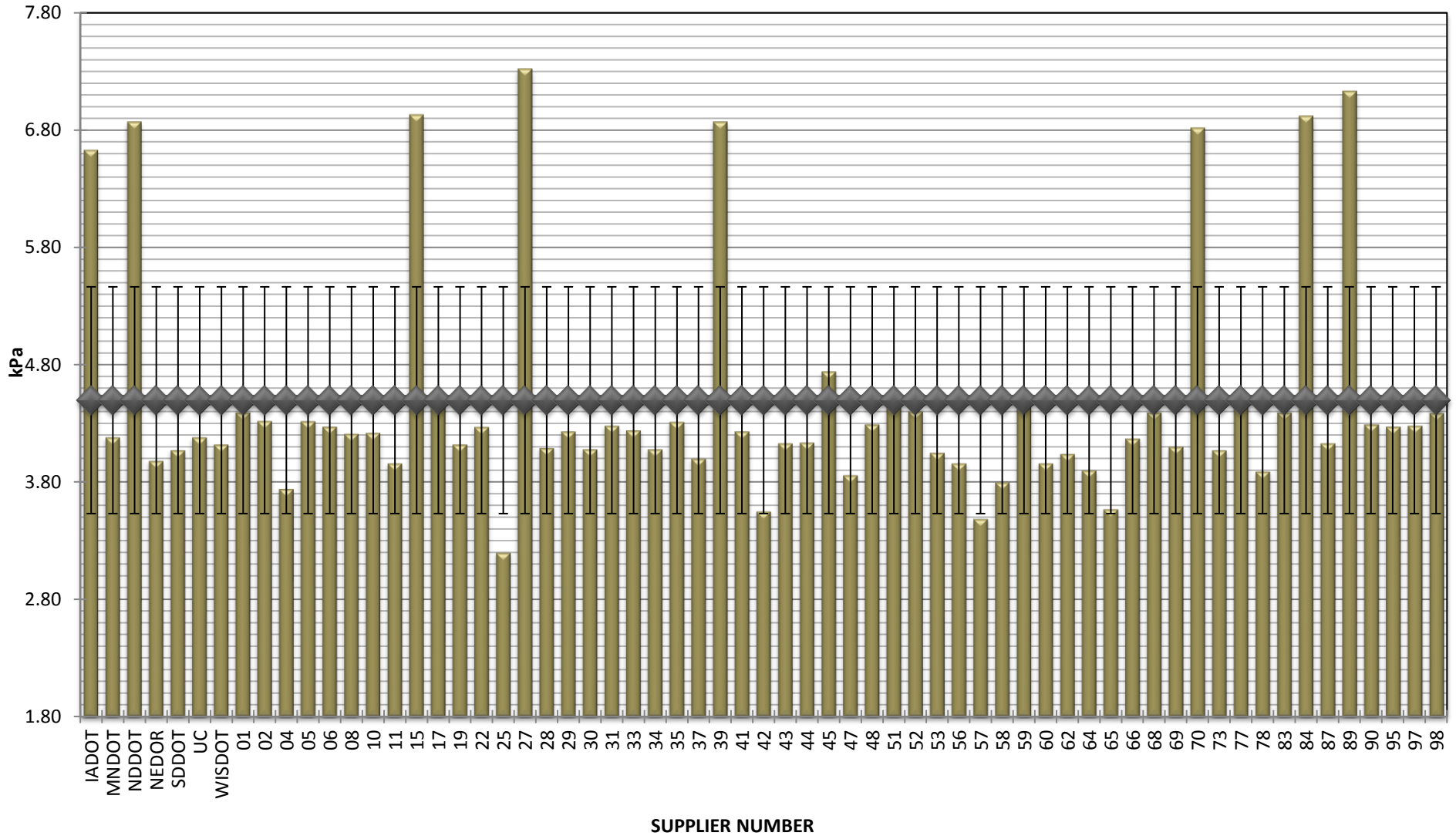
**COMBINED STATE BINDER GROUP ROUND ROBIN
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DSR - ORIGINAL



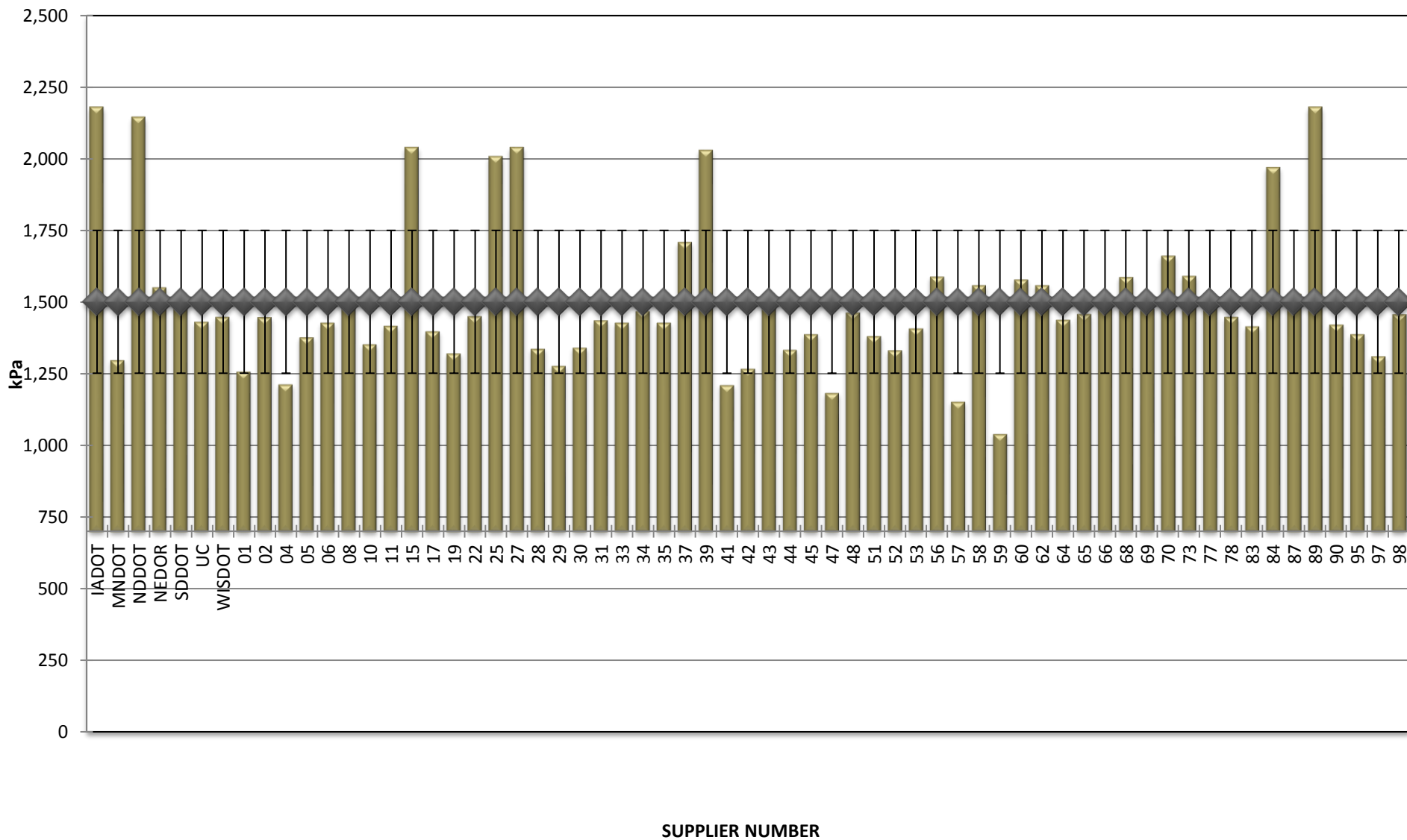
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DSR - RTFO



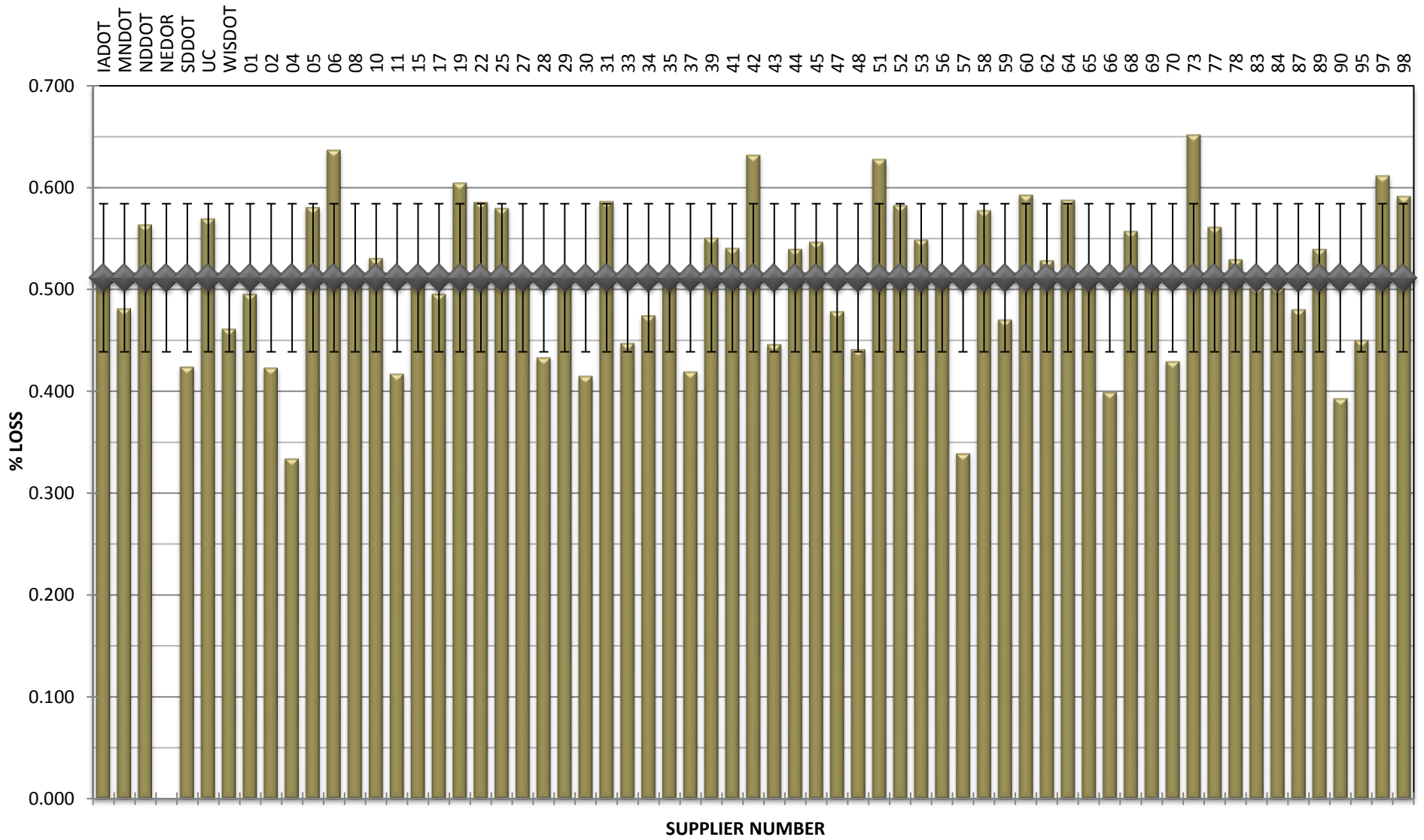
**COMBINED STATE BINDER GROUP ROUND ROBIN
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DSR - PAV



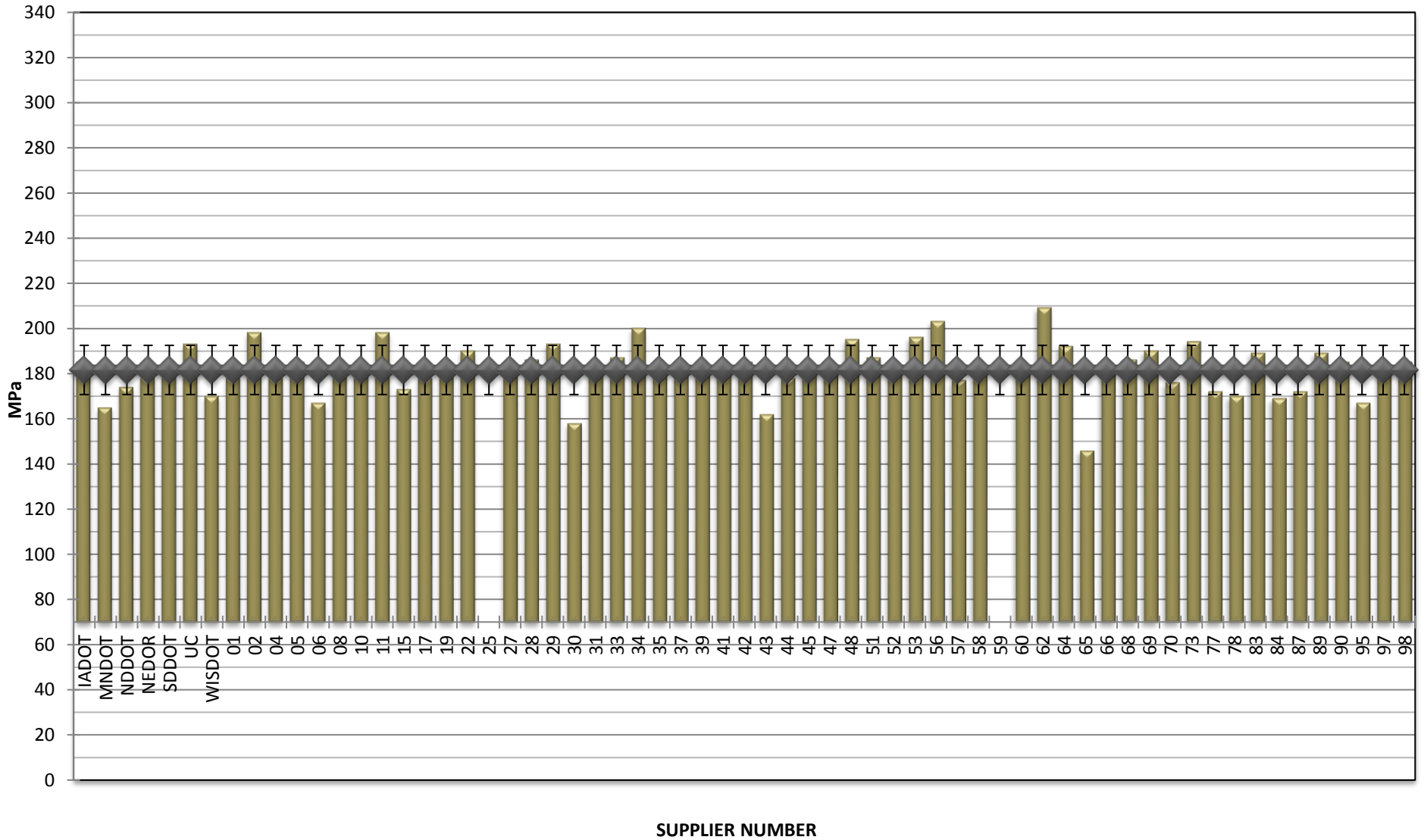
**COMBINED STATE BINDER GROUP ROUND ROBIN
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RTFO MASS LOSS



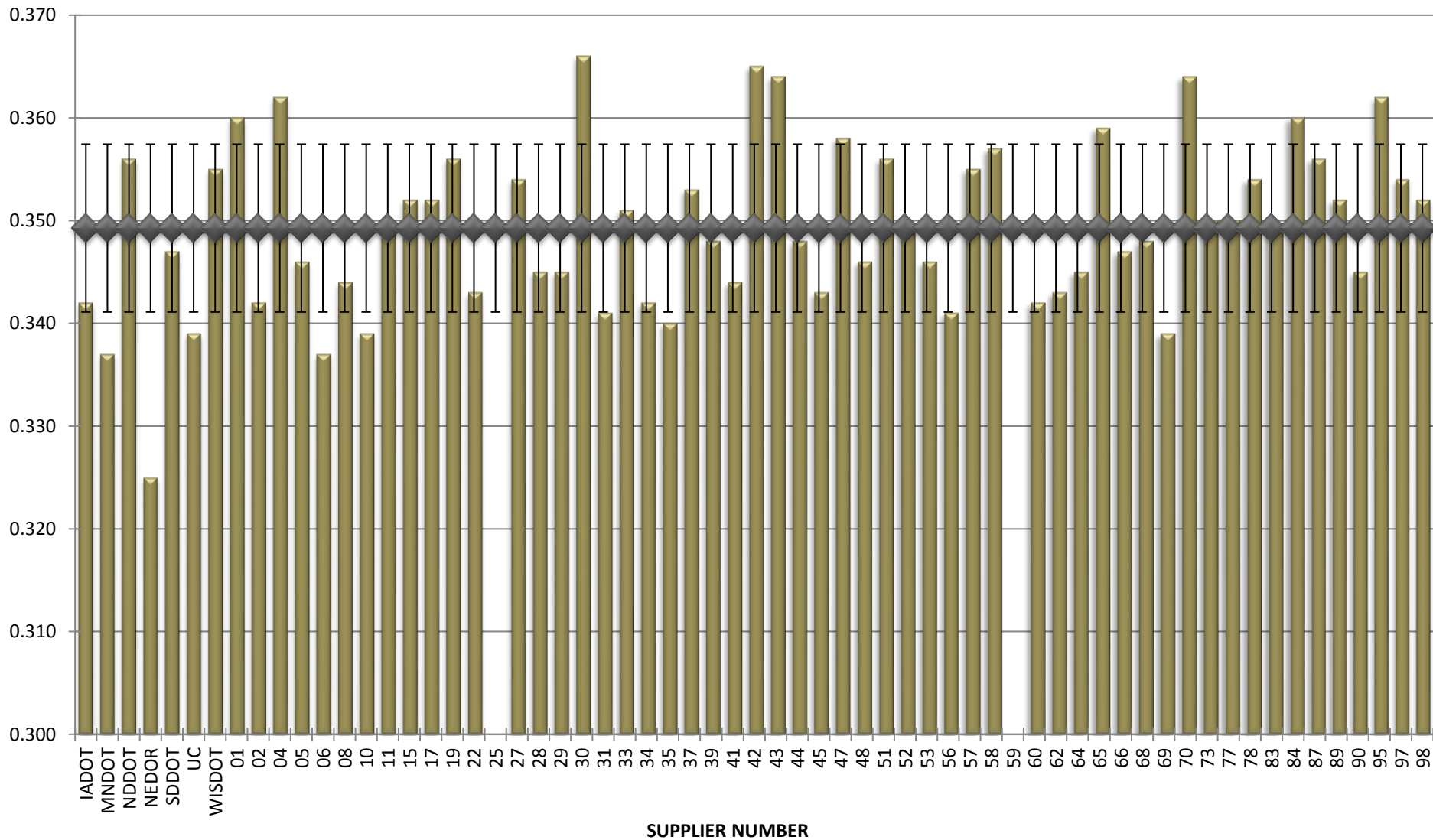
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BBR STIFFNESS



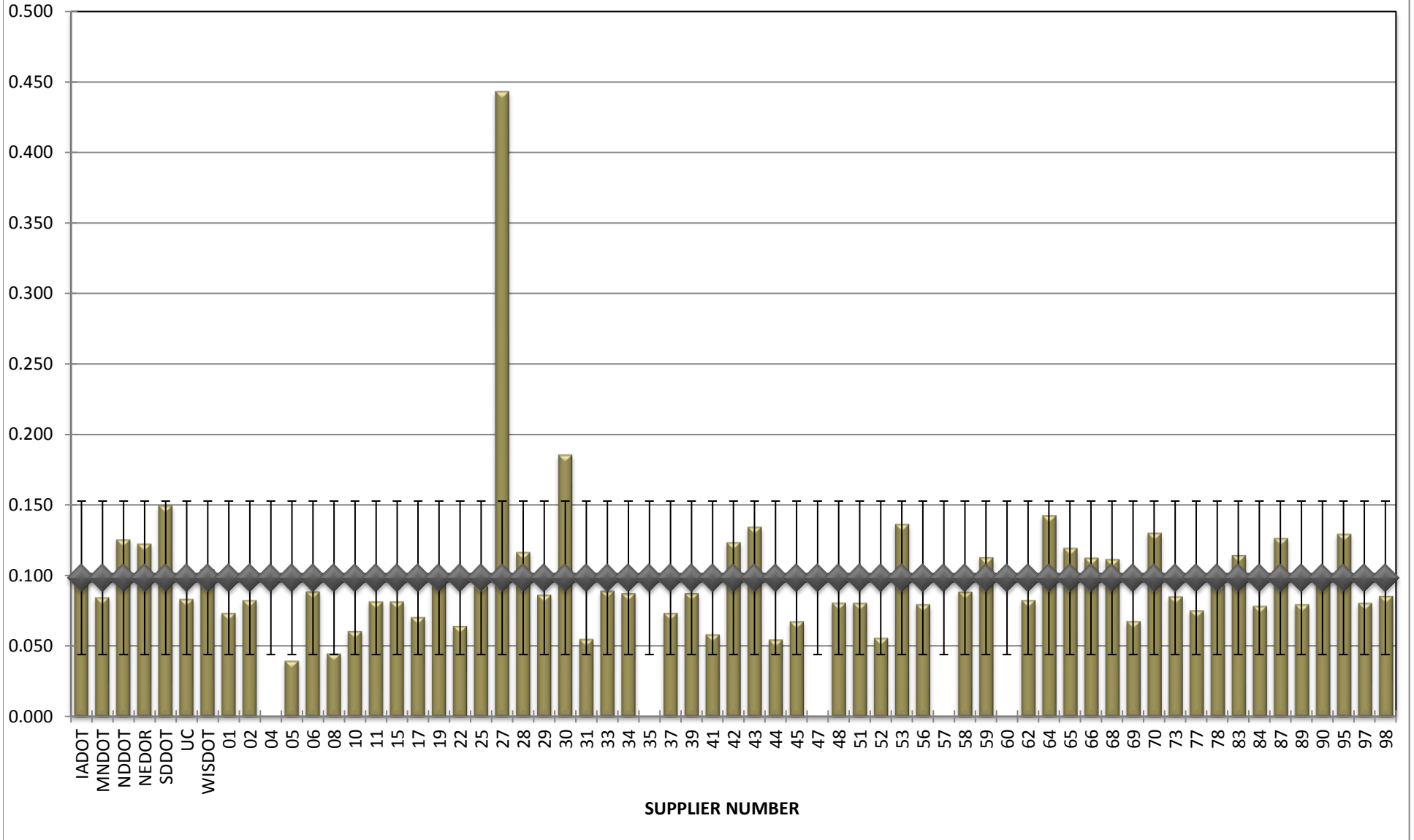
**COMBINED STATE BINDER GROUP ROUND ROBIN
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BBR m-VALUE



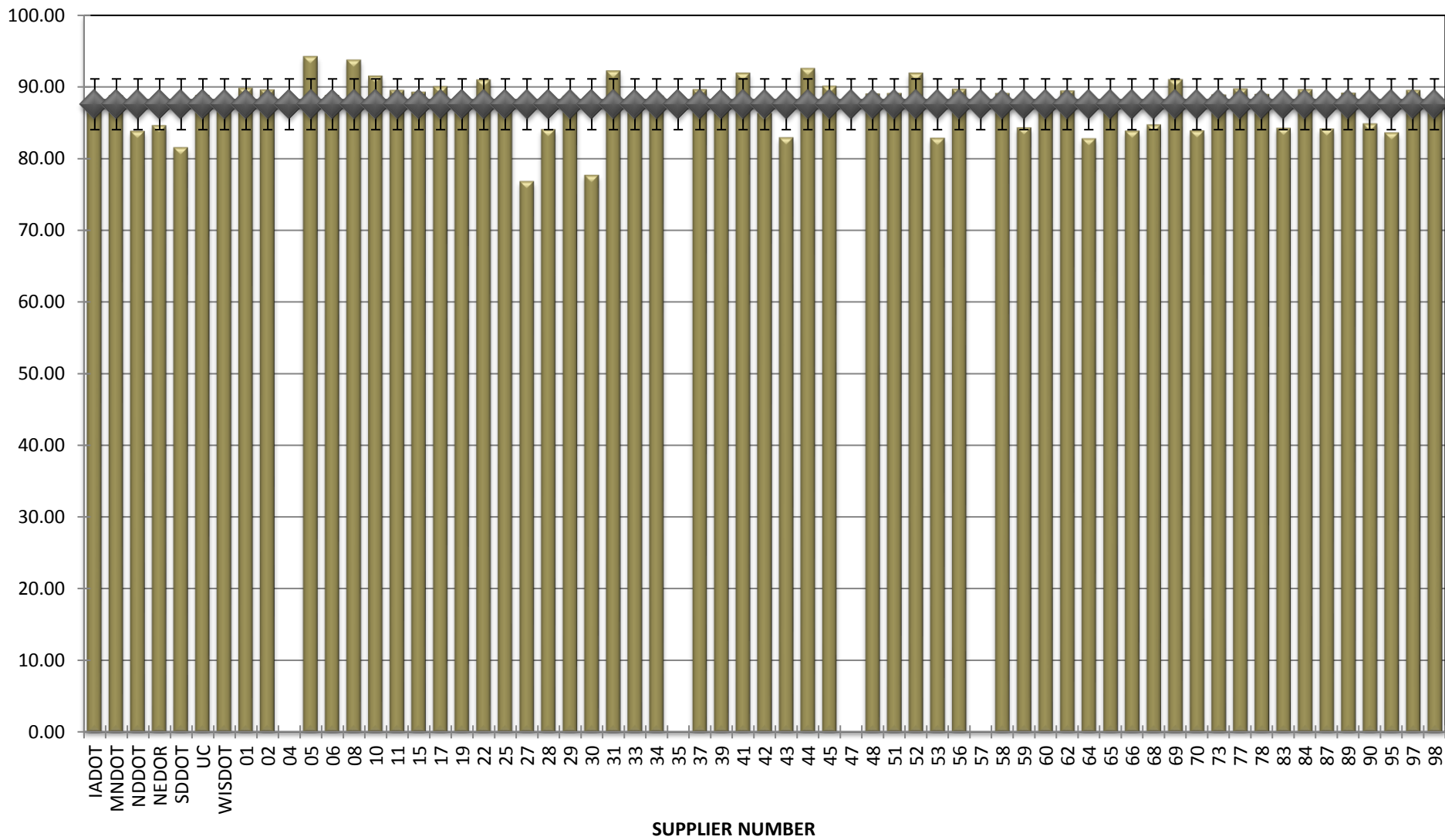
**COMBINED STATE BINDER GROUP ROUND ROBIN
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Jnr @ 100 Pa



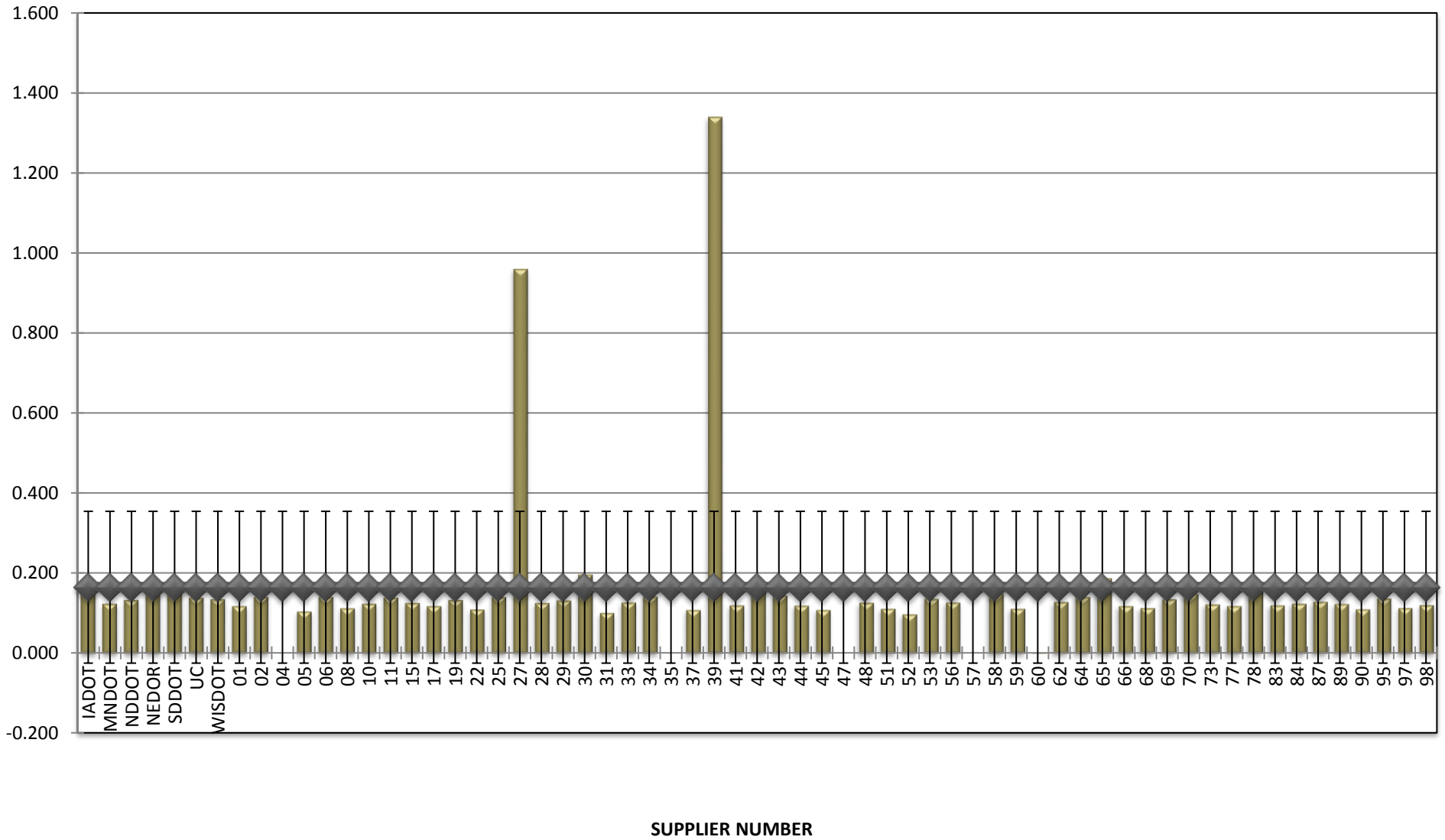
**COMBINED STATE BINDER GROUP ROUND ROBIN
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% Recovery @ 100 Pa



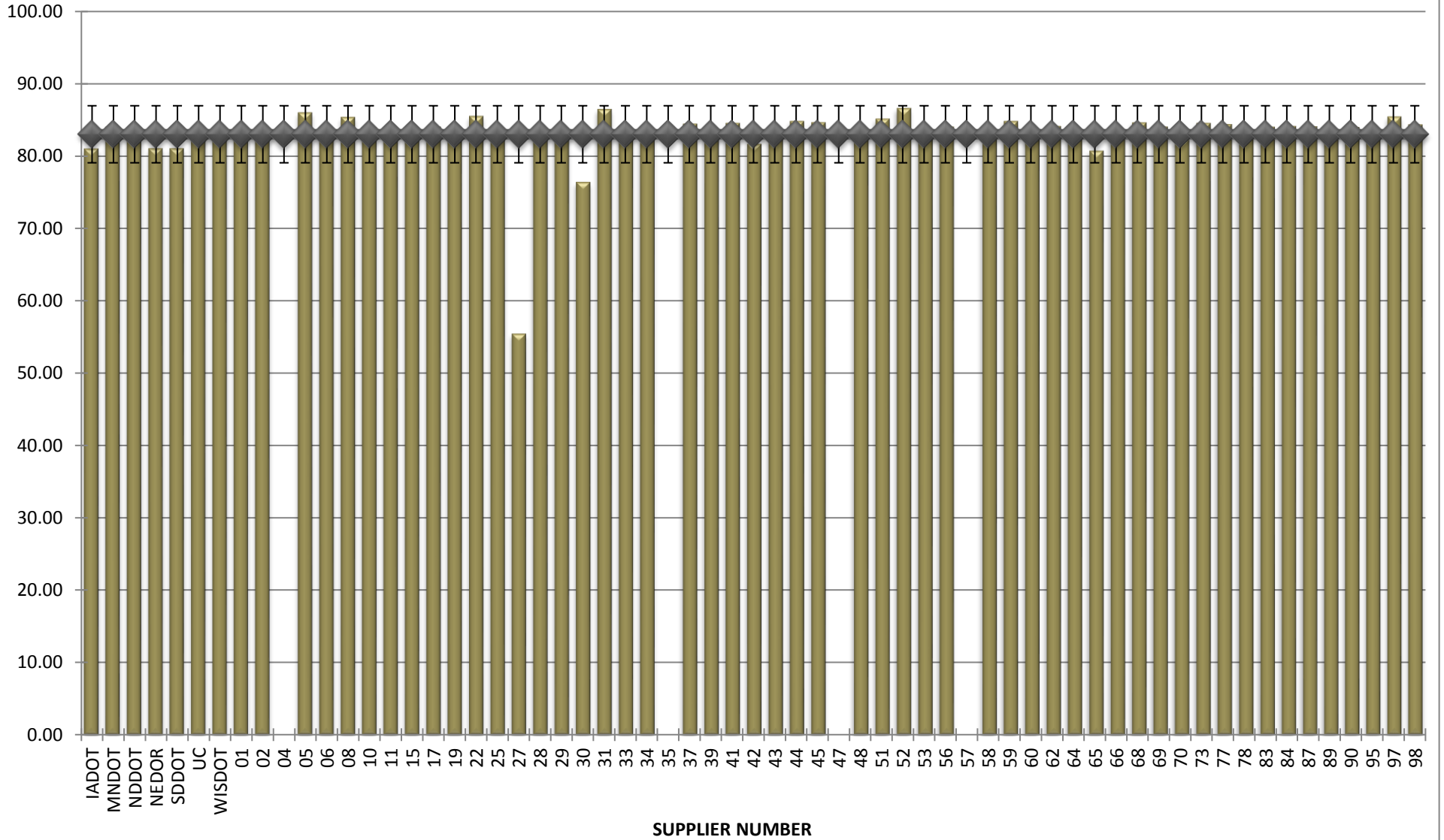
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Jnr @ 3200 Pa



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



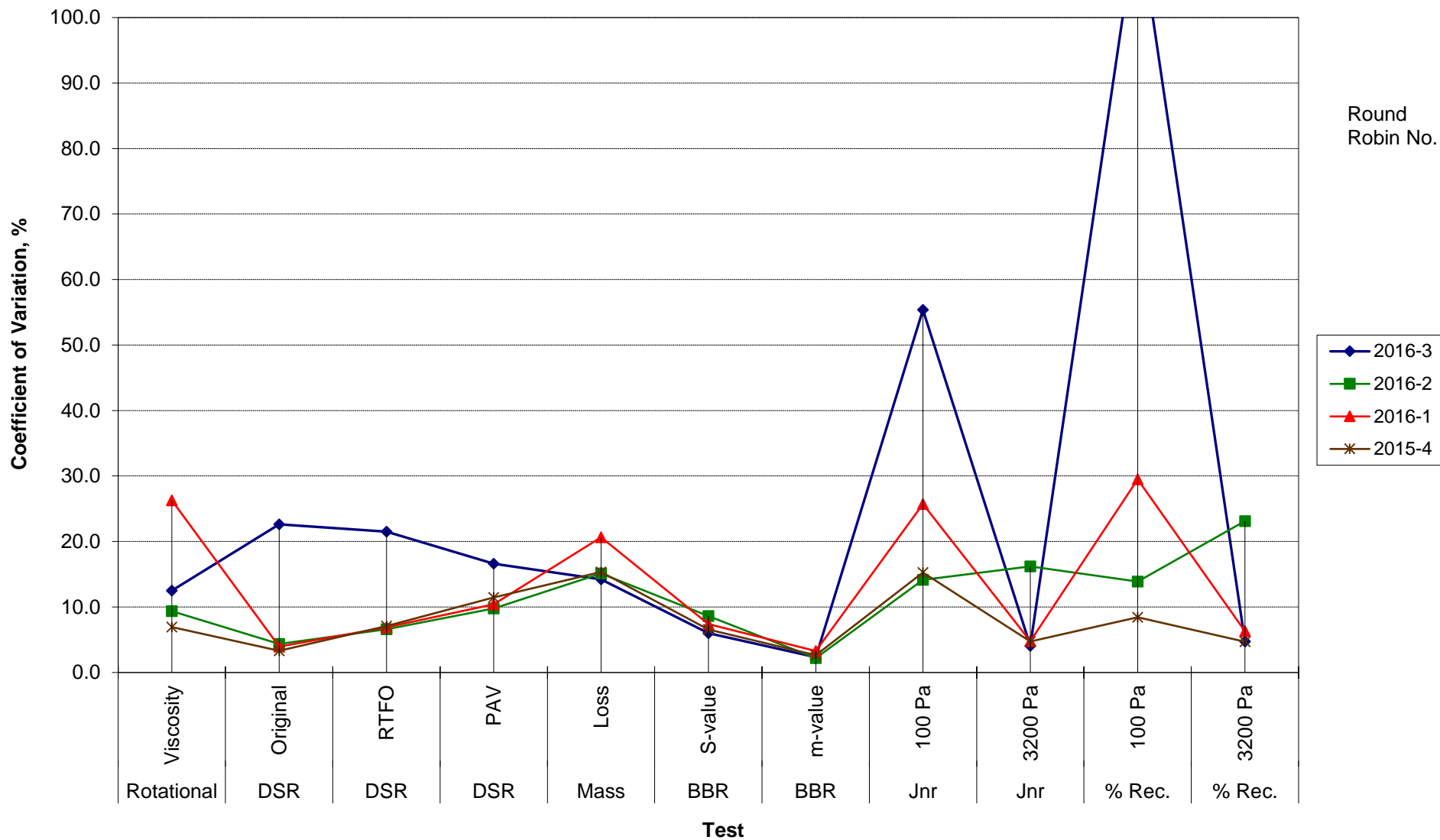
**COMBINED STATE BINDER GROUP ROUND ROBIN
SUMMARY A**

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
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
2016-1	62	26.266	3.967	6.913	10.424	20.651	7.371	3.280	25.738	4.753	29.486	6.310	21.628
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

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	0.962	1.96	4.50	1,501	0.511	182	0.349	0.092	87.77	0.130	83.49
Std. Dev.	0.1463	0.4096	0.9475	254.99	0.0988	34.65	0.0649	0.0606	22.3267	0.1894	20.7642
Coef. of Var.	15.210	20.849	21.070	16.988	19.318	19.015	18.569	65.517	25.437	145.619	24.870

**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