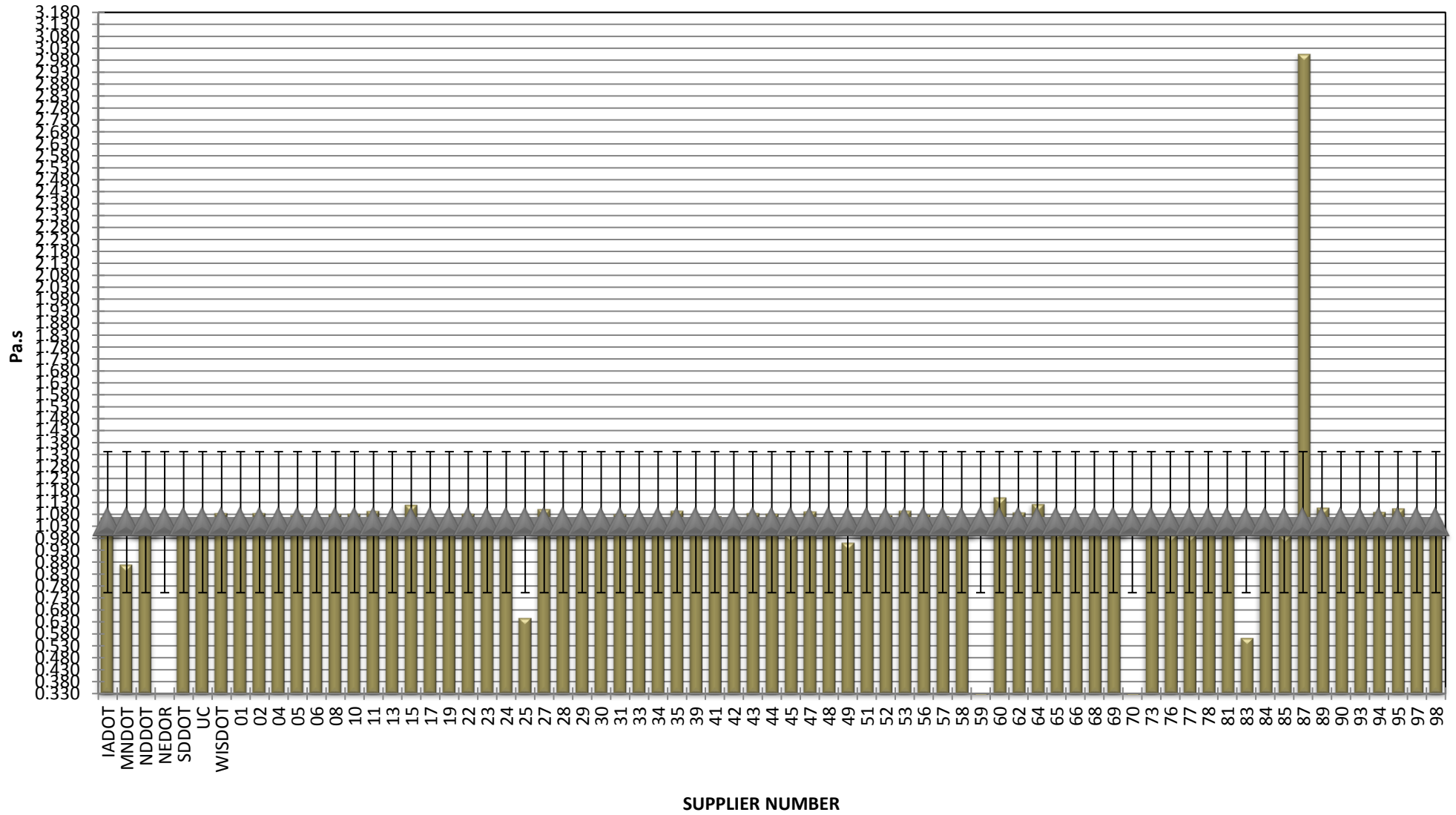


COMBINED STATE BINDER GROUP ROUND ROBIN SUMMARY A 2016-4

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	1.072	1.23	2.610	1.560	0.410	242	0.335	0.189	73.55	0.231	67.44
MNDOT	0.875	1.26	2.760	1.370	0.320	149	0.327	0.170	75.11	0.207	69.39
NDDOT	1.065	1.36	2.700	1.326	0.491	237	0.340	0.201	70.10	0.214	68.00
NEDOR		1.24	2.980	1.525	0.440	250	0.334	0.189	71.43	0.196	69.94
SDDOT	1.038	1.27	2.510	1.530	0.353	229	0.340	0.223	66.33	0.241	66.28
UC	1.027	1.23	2.630	1.547	0.415	240	0.340	0.169	76.00	0.203	72.00
WISDOT	1.090	1.26	2.510	1.560	0.407	228	0.350	0.211	72.17	0.258	65.79
01	1.056	1.21	2.670	1.700	0.450	216	0.343	0.170	74.80	0.210	68.80
02	1.090	1.28	2.570	1.454	0.349	256	0.338	0.189	74.94	0.233	68.88
04	1.030	1.23	2.371	1.317	0.282	233	0.347				
05	1.081	1.26	2.719	1.447	0.462	237	0.339	0.138	78.74	0.194	71.10
06	1.050	1.18	2.460	1.330	0.517	207	0.338	0.204	74.05	0.250	67.82
08	1.085	1.24	2.759	1.430	0.361	233	0.340	0.147	77.27	0.222	65.27
10	1.087	1.24	2.765	1.425	0.468	235	0.338	0.146	77.22	0.200	69.72
11	1.099	1.27	2.660	1.469	0.384	259	0.335	0.181	75.06	0.224	68.74
13	1.060	1.22	2.800	1.590	0.422	229	0.345	0.167	74.20	0.197	69.16
15	1.125	1.28	2.720	1.370	0.438	234	0.342	0.169	75.65	0.209	69.59
17	1.015	1.18	2.640	1.770	0.448	218	0.336	0.180	74.00	0.230	67.50
19	1.060	1.24	2.674	1.427	0.529	232	0.340	0.178	75.20	0.216	69.50
22	1.087	1.28	2.773	1.417	0.375	236	0.342	0.155	76.81	0.201	70.32
23	1.045	1.23	2.750	1.485	0.480	238	0.330	0.180	74.10	0.219	68.19
24	1.033	1.19	2.660	1.480	0.406	229	0.335	0.196	73.03	0.243	66.90
25	0.650	1.23	3.150	1.401	0.510	238	0.356				
27	1.107	1.26	2.750	1.490	0.444	224	0.349	0.175	75.02	0.214	69.09
28	1.036	1.24	2.610	1.808	0.371	247	0.329	0.197	74.05	0.236	68.72
29	1.040	1.26	2.740	1.446	0.440	252	0.336	0.173	75.73	0.212	70.00
30	1.040	1.28	2.700	1.678	0.517	264	0.331	0.171	75.50	0.209	69.70
31	1.085	1.24	2.752	1.487	0.461	236	0.338	0.158	75.67	0.197	70.03
33	1.043	1.25	2.590	1.410	0.395	236	0.343	0.188	74.50	0.229	68.55
34	1.047	1.30	2.740	1.507	0.367	242	0.339	0.169	76.12	0.209	70.36
35	1.100	1.30	2.730	1.450	0.401	229	0.317				
39	1.075	1.23	2.760	1.260	0.445	219	0.348	0.173	74.68	0.211	69.07
41	1.077	1.27	2.712	1.536	0.392	235	0.336	0.147	77.77	0.197	70.77
42	1.075	1.22	2.640	1.310	0.535	237	0.349	0.185	74.49	0.226	68.43
43	1.090	1.26	2.540	1.480	0.354	218	0.360	0.206	73.12	0.212	71.64
44	1.087	1.25	2.805	1.640	0.484	242	0.331	0.143	77.51	0.195	70.54
45	1.000	1.17	3.170	1.560	0.448	225	0.328	0.150	74.70	0.180	69.30
47	1.097	1.18	2.564	1.402	0.406	240	0.348				
48	1.036	1.29	2.920	1.576	0.373	241	0.337	0.152	76.92	0.187	71.37
49	0.967	1.24	2.400	1.340	0.416	234	0.346	0.215	73.39	0.262	67.19
51	1.051	1.24	2.588	1.137	0.482	237	0.352	0.185	75.20	0.224	69.50
52	1.081	1.26	2.866	1.651	0.493	240	0.335	0.148	77.00	0.186	71.22
53	1.100	1.21	2.930	1.570	0.689	263	0.322	0.183	71.69	0.194	69.56
56	1.083	1.24	2.830	1.440	0.436	251	0.336	0.151	77.24	0.185	71.68
57	1.077	1.19	2.237	1.296	0.424	228	0.351				
58	1.050	1.23	2.700	1.570	0.448	234	0.348	0.138	76.44	0.168	71.04
59	0.110	1.25	2.794	1.423	0.457	249	0.343	0.195	71.60	0.205	69.50
60	1.155	1.22	2.990	1.660	0.478	242	0.336	0.175	73.29	0.210	67.78
62	1.093	1.24	2.810	1.380	0.441	254	0.332	0.157	76.42	0.193	70.79
64	1.128	1.22	2.410	1.370	0.424	227	0.338	0.257	68.22	0.276	65.22
65	1.012	1.19	2.920	1.960	0.398	222	0.223	0.193	71.06	0.204	69.04
66	1.039	1.25	2.680	1.704	0.368	252	0.329	0.188	73.09	0.224	67.67
68	1.045	1.25	2.650	1.645	0.455	236	0.341	0.223	70.32	0.238	67.50
69	1.045	1.24	2.570	1.512	0.432	249	0.335	0.183	74.80	0.209	71.60
70	0.111	1.28	2.850	1.399	0.418	215	0.342	0.193	72.15	0.192	71.71
73	1.060	1.25	2.760	1.604	0.518	257	0.335	0.165	75.70	0.201	70.20
76	1.002	1.34	2.850	1.190	0.430	240	0.348	0.189	71.93	0.196	70.32
77	1.000	1.25	2.850	1.530	0.473	241	0.345	0.159	74.51	0.192	68.97
78	1.060	1.23	2.620	1.490	0.438	234	0.349	0.190	73.57	0.234	67.16
81	1.050	1.20	2.790	1.450	0.489	240	0.348	0.168	75.00	0.206	69.03
83	0.566	1.26	2.823	1.405	0.480	251	0.332	0.196	71.67	0.201	70.56
84	1.053	1.26	2.730	1.435	0.430	246	0.340	0.165	76.33	0.203	70.46
85	0.998	1.34	2.940	1.150	0.440	247	0.345	0.179	72.58	0.184	71.21
87	3.003	1.26	2.690	1.540	0.425	230	0.336	0.205	70.98	0.213	69.22
89	1.113	1.26	2.770	1.320	0.453	233	0.342	0.166	75.71	0.206	69.66
90	1.044	1.29	2.630	1.665	0.379	254	0.330	0.191	75.06	0.237	68.73
93	1.048	1.34	2.570	1.473	0.481	247	0.338	0.214	72.44	0.262	66.14
94	1.095	1.27	2.420	1.320	0.065	213	0.351	0.090	72.16	0.282	65.54
95	1.110	1.25	2.560	1.550	0.352	218	0.352	0.209	73.08	0.215	71.60
97	1.056	1.25	3.080	1.622	0.555	241	0.343	0.137	78.00	0.166	72.90
98	1.058	1.25	2.722	1.316	0.505	235	0.356	0.175	75.30	0.211	69.70
99	1.031	1.22	2.850	1.596	0.400	254	0.331	0.164	76.50	0.203	70.71
Average	1.047	1.25	2.715	1.482	0.432	236	0.338	0.177	74.30	0.213	69.27
Std. Dev.	0.295	0.04	0.170	147	0.075	16	0.016	0.026	2.35	0.023	1.74
Coef. of Var.	28.172	2.99	6.269	10	17.390	7	4.719	14.487	3.16	10.957	2.51

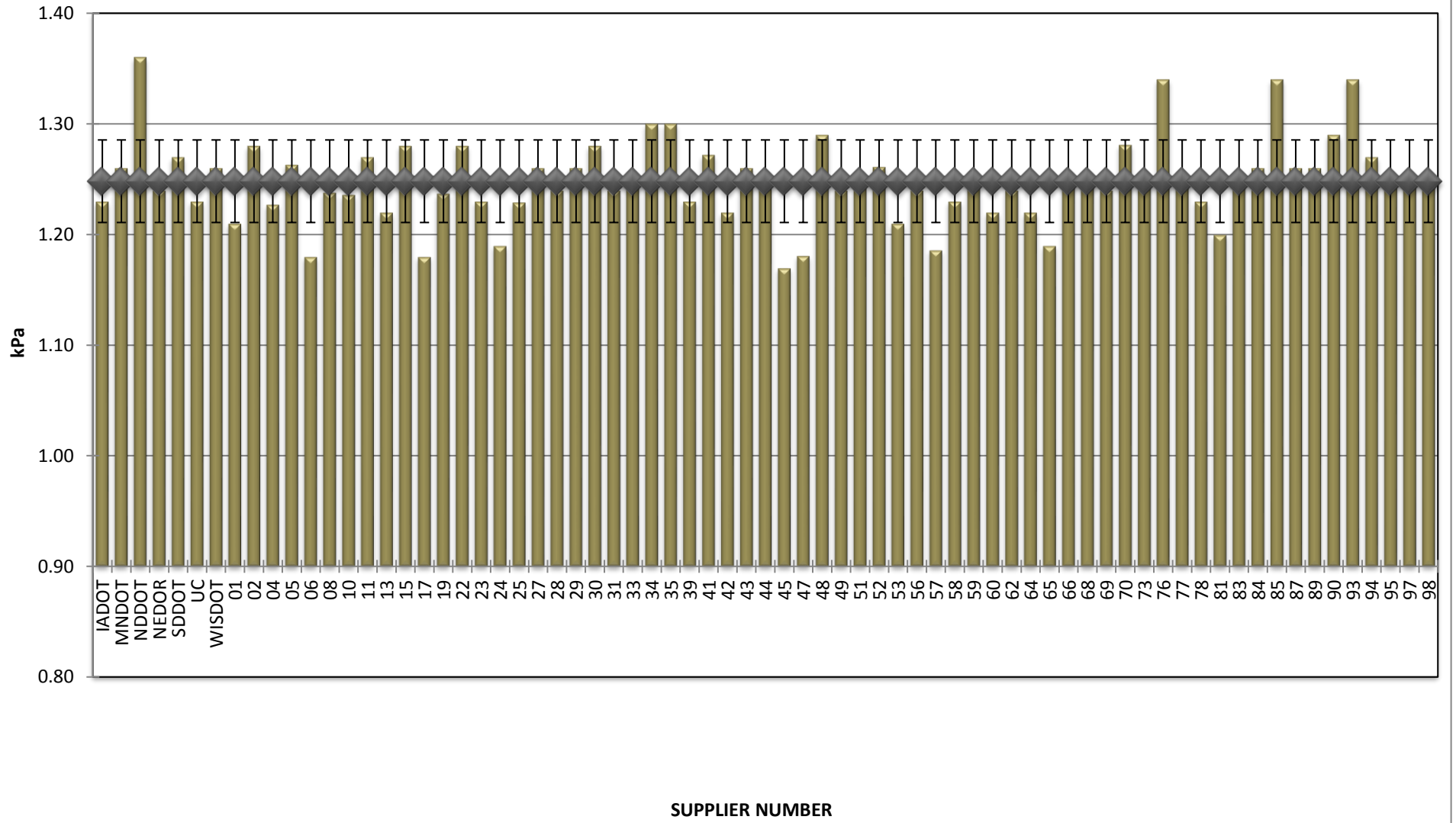
COMBINED STATE BINDER GROUP ROUND ROBIN
SUMMARY A 2016-4

ROTATIONAL VISCOSITY



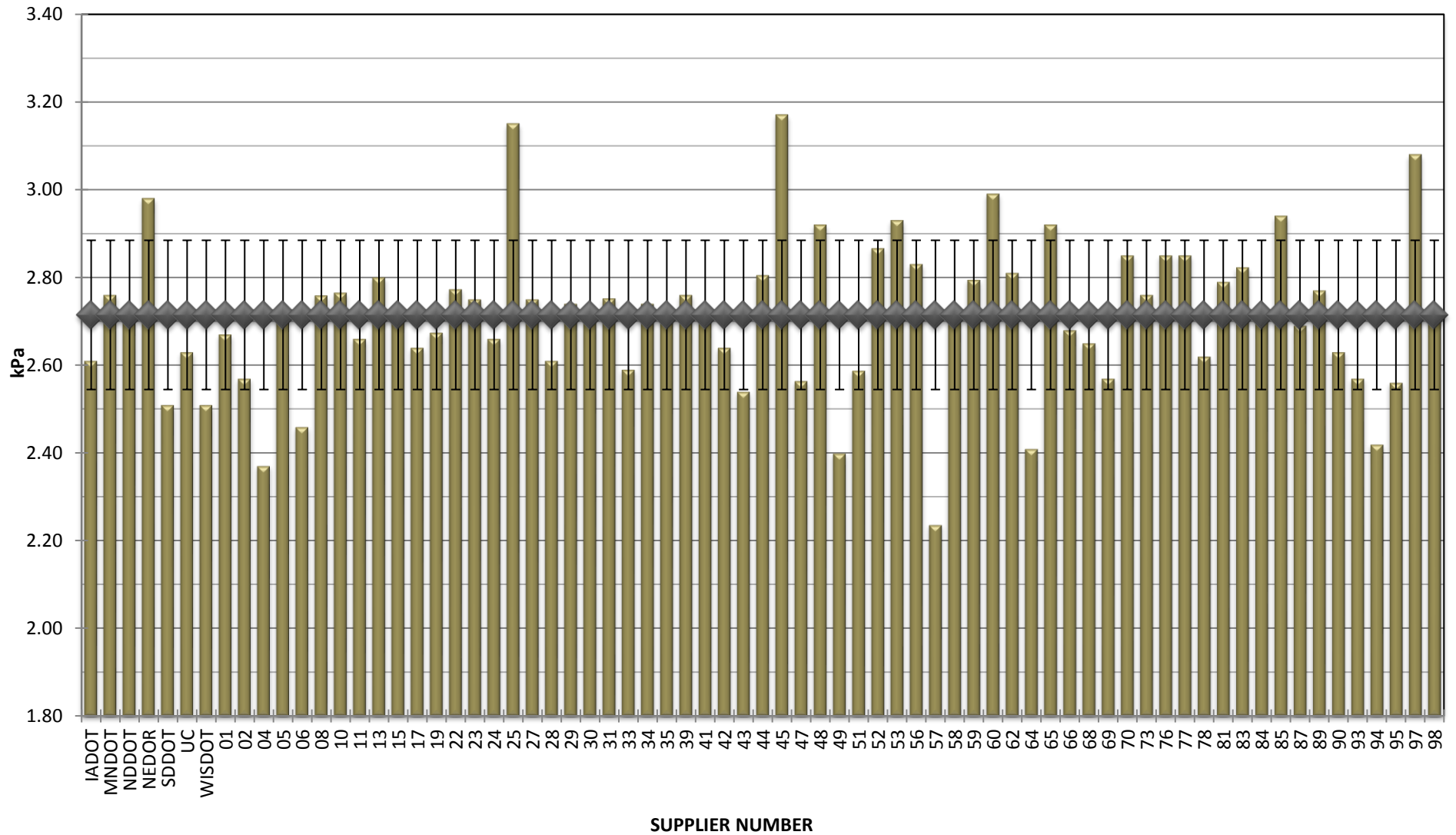
**COMBINED STATE BINDER GROUP ROUND ROBIN
SUMMARY A 2016-4**

DSR - ORIGINAL



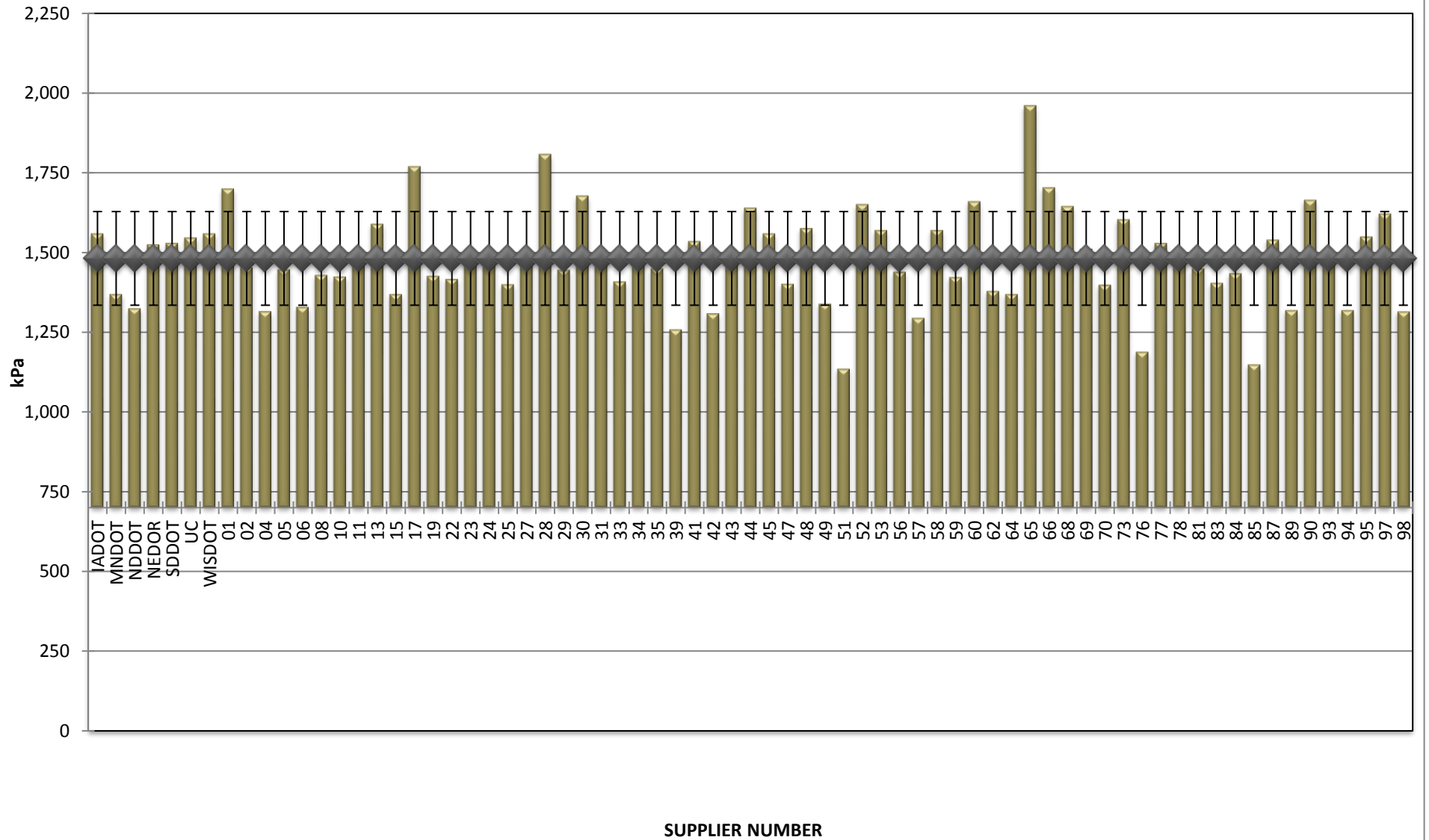
COMBINED STATE BINDER GROUP ROUND ROBIN
SUMMARY A 2016-4

DSR - RTFO



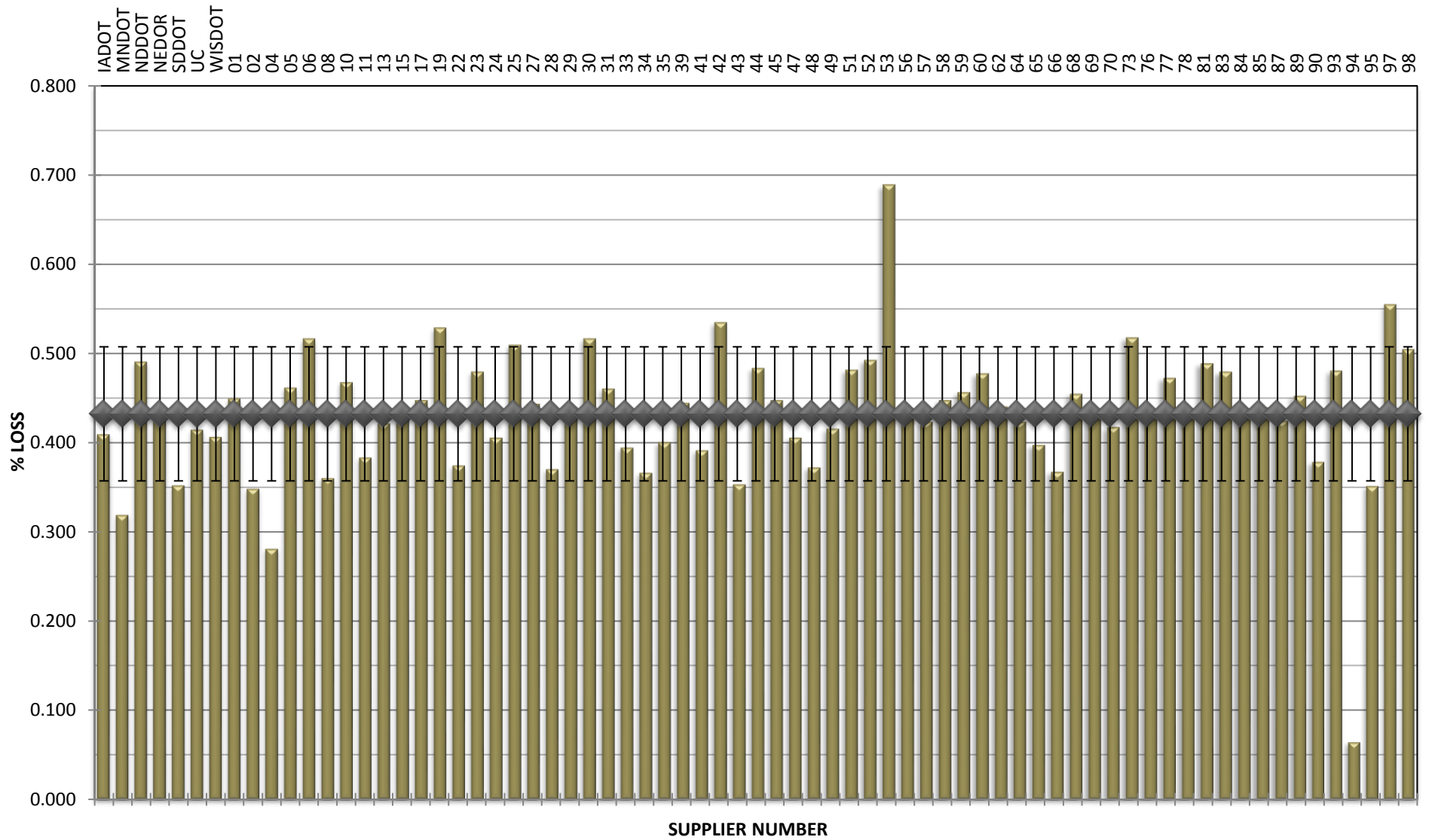
**COMBINED STATE BINDER GROUP ROUND ROBIN
SUMMARY A 2016-4**

DSR - PAV



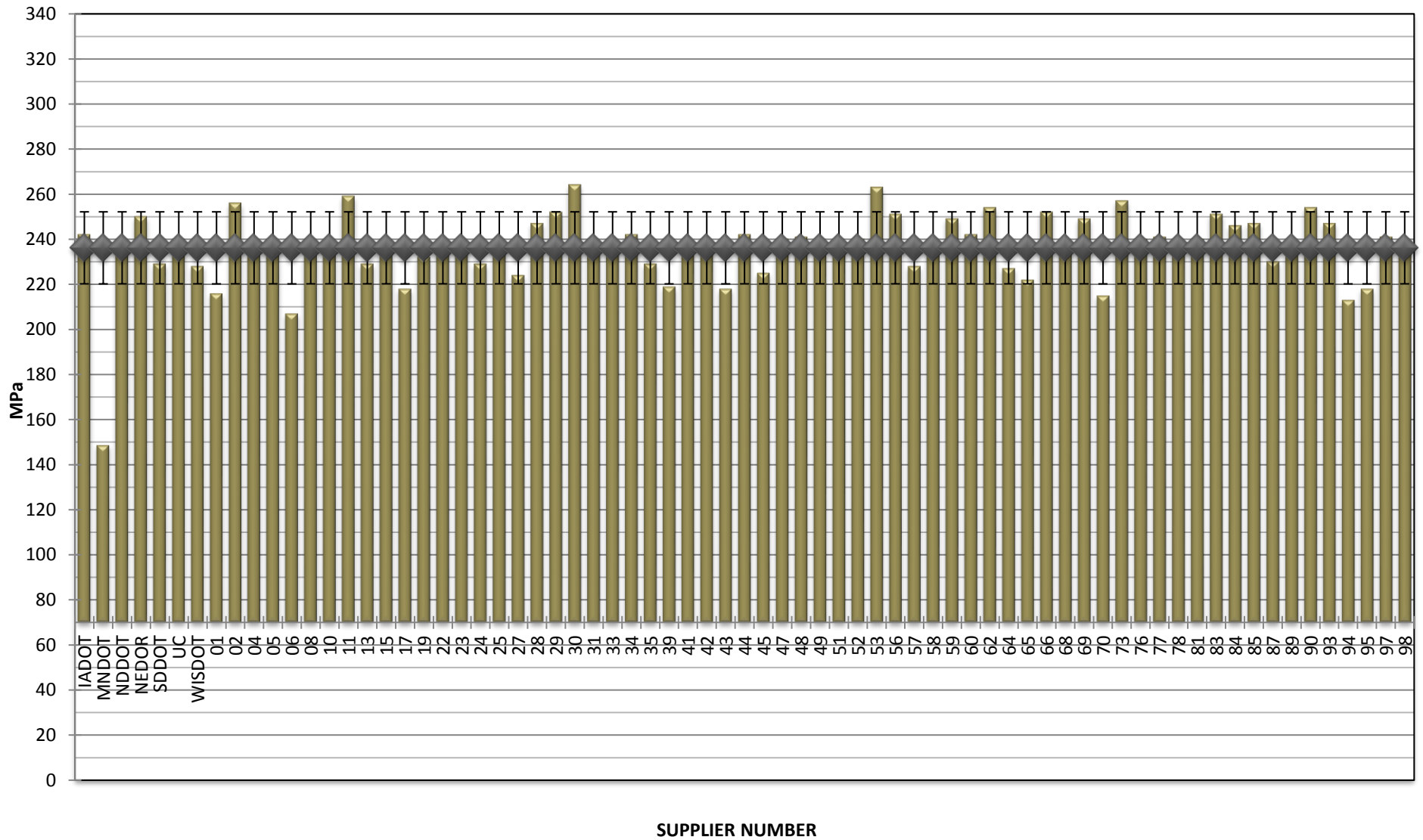
**COMBINED STATE BINDER GROUP ROUND ROBIN
SUMMARY A 2016-4**

RTFO MASS LOSS



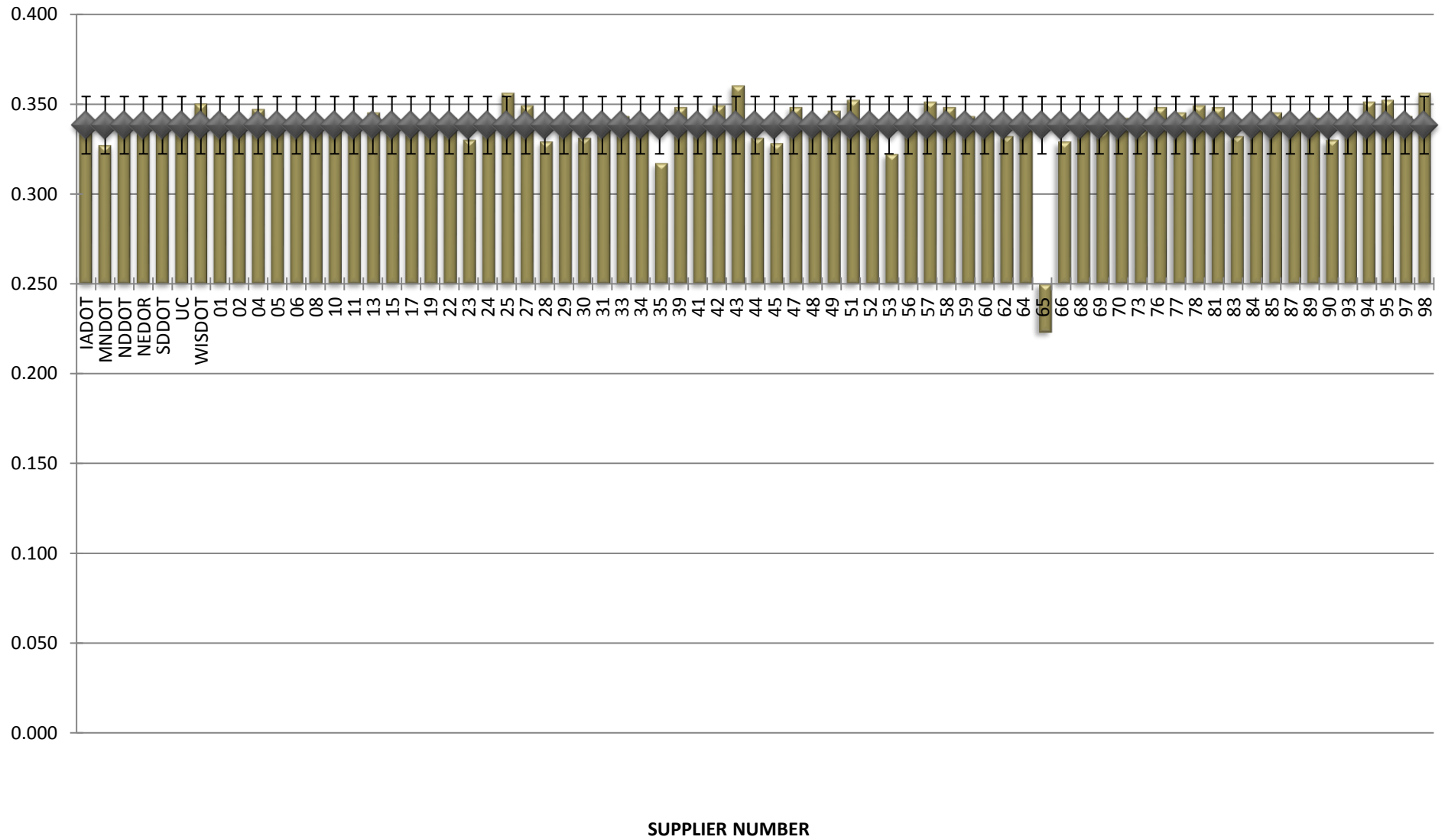
COMBINED STATE BINDER GROUP ROUND ROBIN
SUMMARY A 2016-4

BBR STIFFNESS



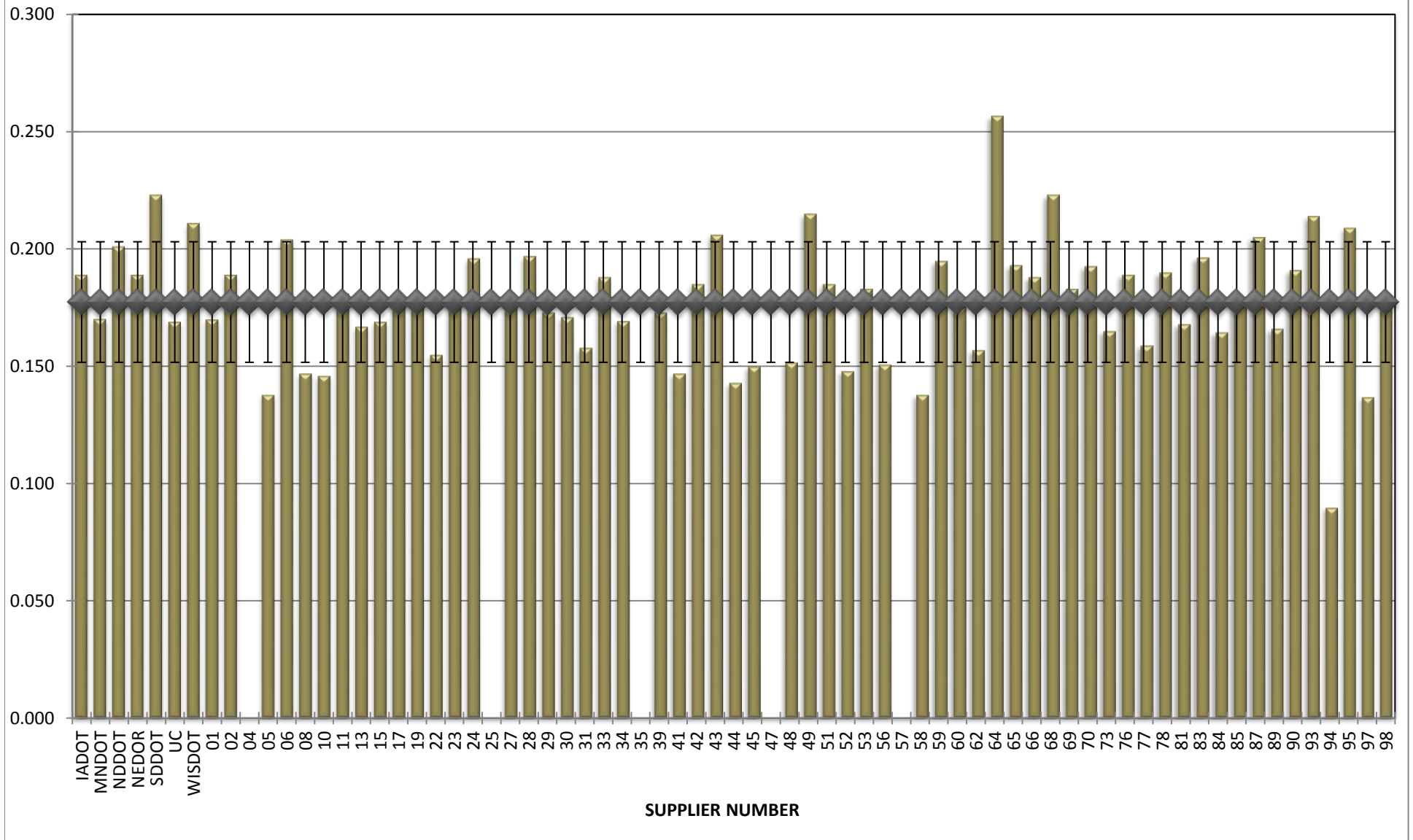
**COMBINED STATE BINDER GROUP ROUND ROBIN
SUMMARY A 2016-4**

BBR m-VALUE



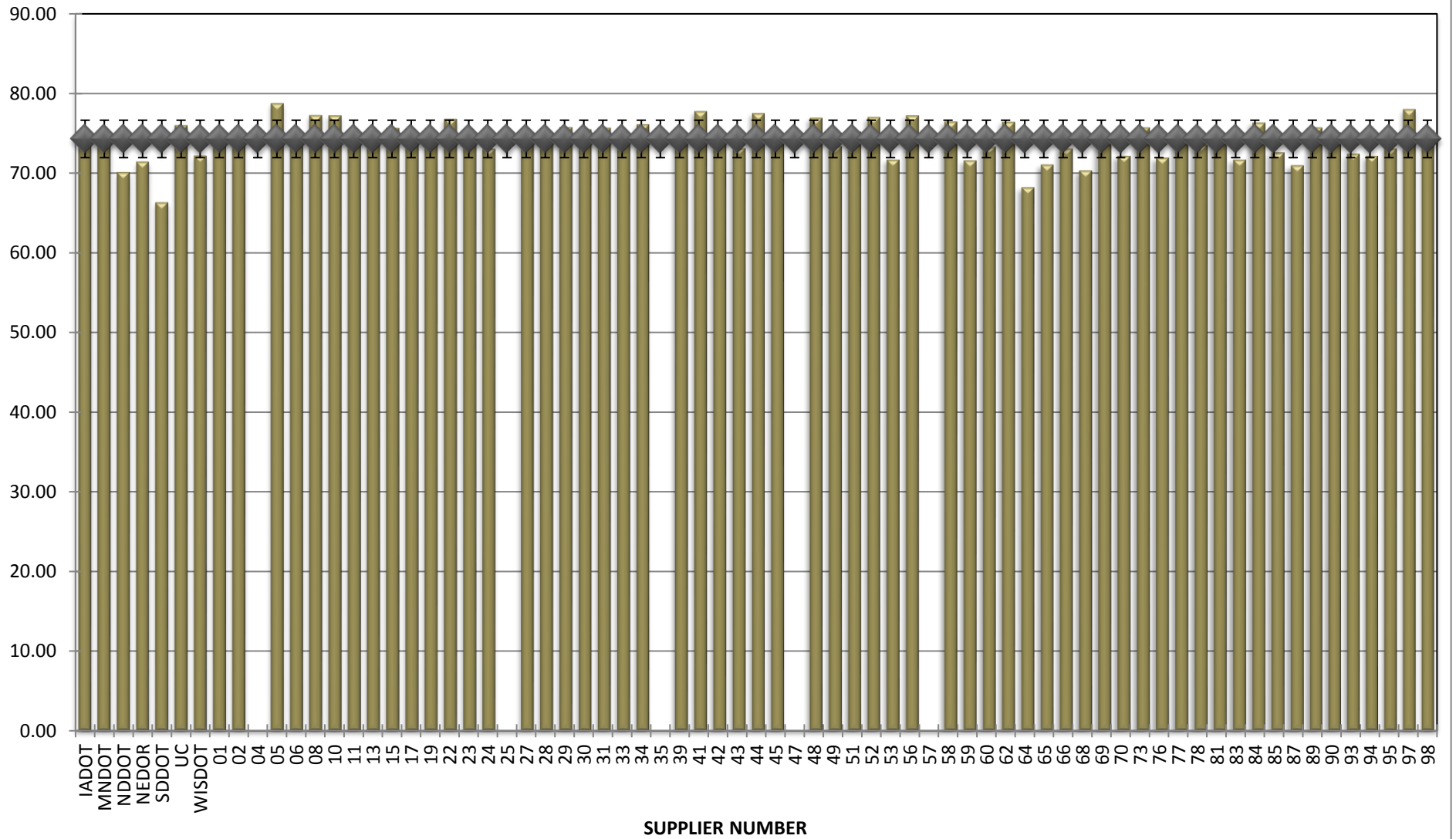
**COMBINED STATE BINDER GROUP ROUND ROBIN
SUMMARY A 2016-4**

Jnr @ 100 Pa



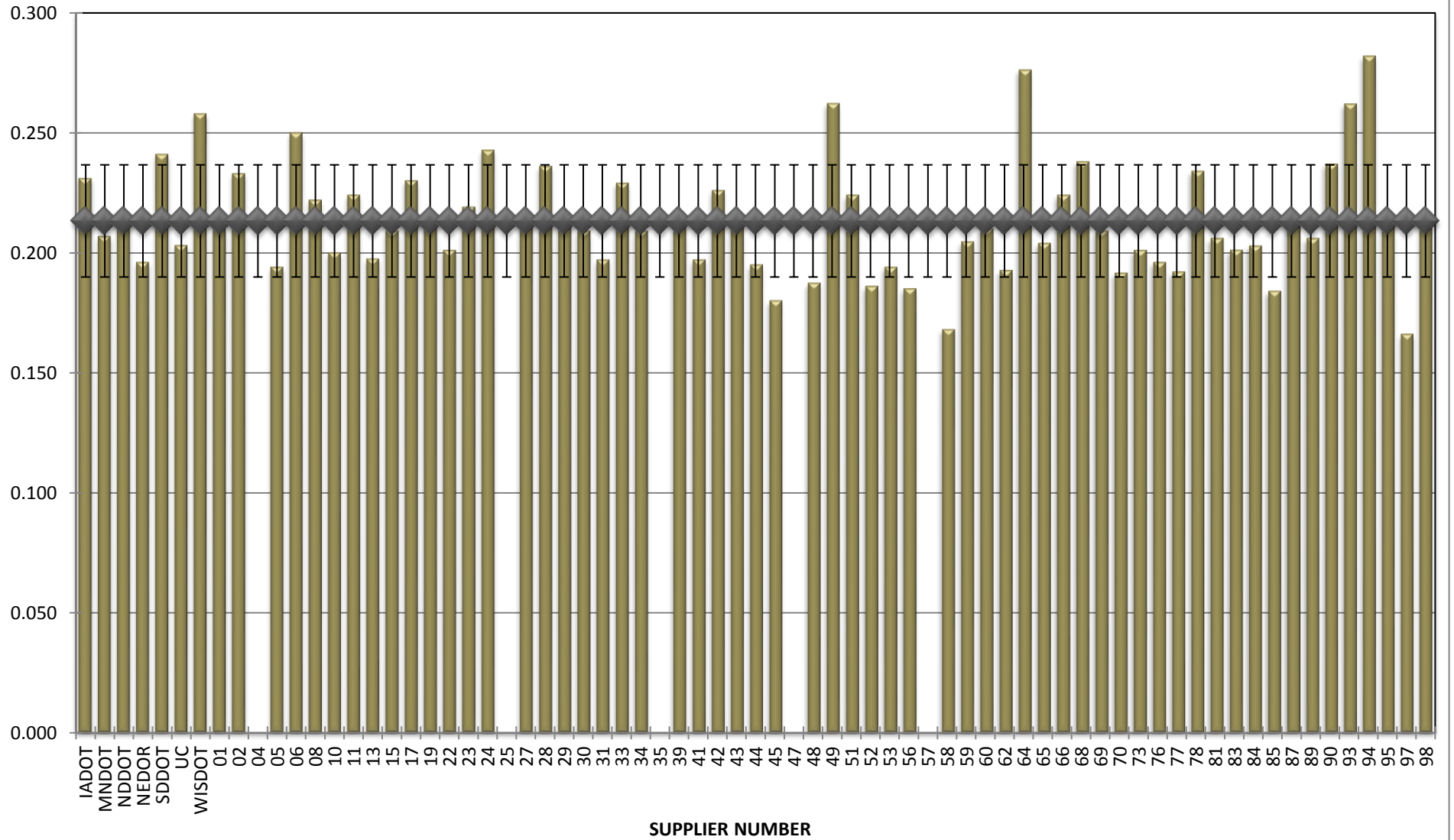
COMBINED STATE BINDER GROUP ROUND ROBIN
SUMMARY A 2016-4

% Recovery @ 100 Pa



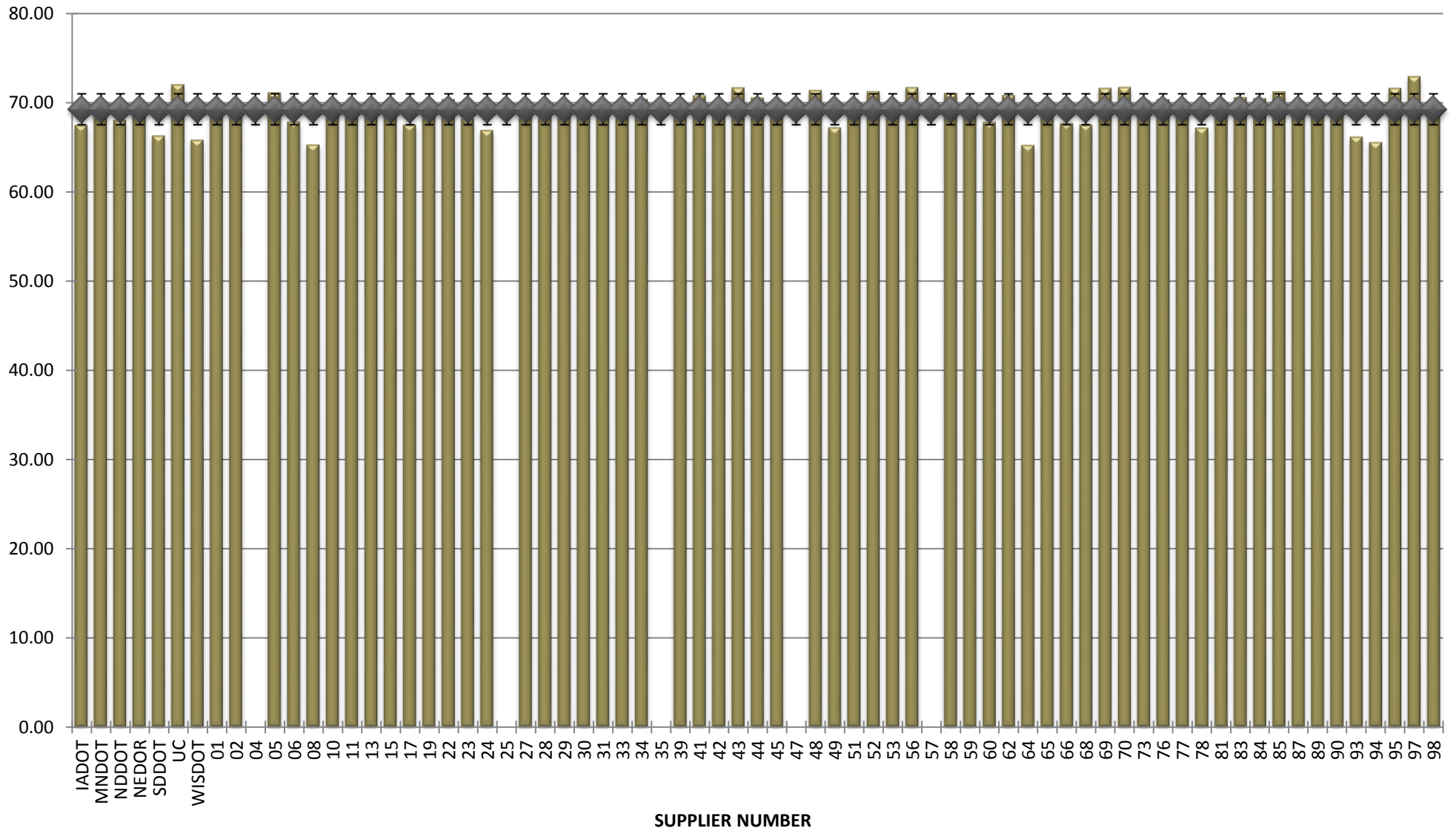
**COMBINED STATE BINDER GROUP ROUND ROBIN
SUMMARY A 2016-4**

Jnr @ 3200 Pa



**COMBINED STATE BINDER GROUP ROUND ROBIN
SUMMARY A 2016-4**

% Recovery @ 3200 Pa



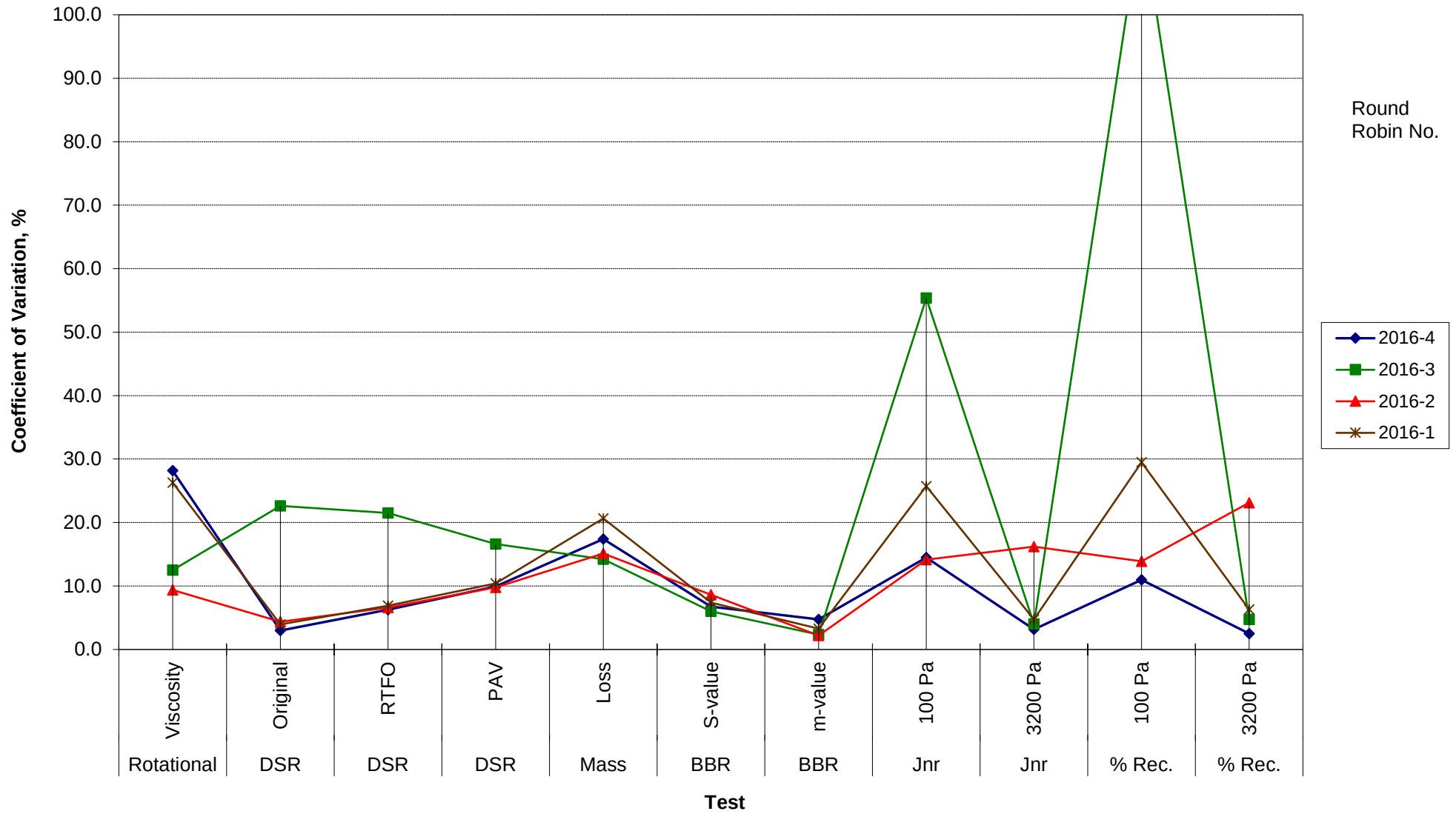
**COMBINED STATE BINDER GROUP ROUND ROBIN
SUMMARY A**

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
2016-4	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
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

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	1.046	1.25	2.71	1,475	0.432	237	0.340	0.178	74.42	0.213	69.27
Std. Dev.	0.0880	0.0374	0.1706	136.44	0.0541	12.12	0.0081	0.0216	2.1475	0.0235	1.7412
Coef. of Var.	8.413	2.998	6.285	9.250	12.517	5.106	2.384	12.190	2.886	11.024	2.514

**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