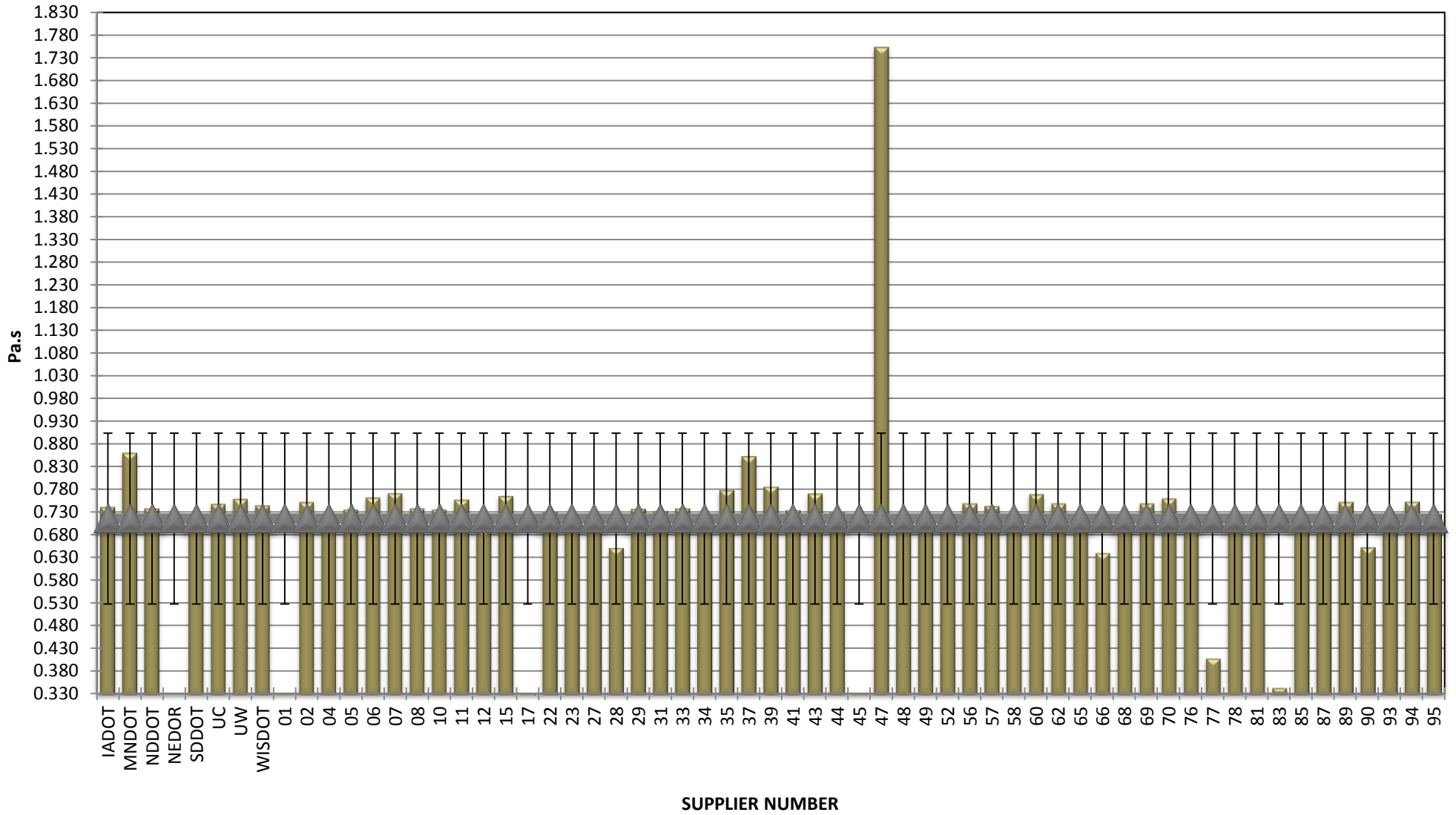


**COMBINED STATE BINDER GROUP ROUND ROBIN SUMMARY A 2016-1**  
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Supplier Number	Rotational Viscosity (Pa.s) @135°C	DSR Original (kPa)	DSR RTFO (kPa)	DSR PAV (kPa)	Mass Loss (%) @163°C	BBR S-value (MPa)	BBR m-value	Jnr @ 100 Pa	% Recov. @ 100 Pa	Jnr @ 3200 Pa	% Recov. @ 3200 Pa
IADOT	0.743	1.53	3.700	2,620	0.611	240	0.326	0.402	56.69	0.508	45.89
MNDOT	0.862	1.56	4.120	3,090	0.631	216	0.315	0.349	58.32	0.443	48.02
NDDOT	0.740	1.55	4.000	2,729	0.693	262	0.325	0.428	53.70	0.516	45.50
NEDOR	1.52	1.52	4.320	2,676	0.621	269	0.301	0.395	54.21	0.470	46.78
SDDOT	0.721	1.51	3.720	2,750	0.499	251	0.330	0.452	52.75	0.521	45.22
UC	0.750	1.46	3.520	2,990	0.611	267	0.311	0.410	56.60	0.544	46.10
UW	0.761	1.47	3.930	2,529	0.561	228	0.319	0.367	55.70	0.445	47.50
WISDOT	0.747	1.57	3.989	2,173	0.568	226	0.324	0.399	52.65	0.460	46.55
01	0.223	1.60	4.340	2,750	0.686	222	0.315	0.340	58.00	0.410	48.70
02	0.754	1.53	3.890	2,572	0.503	255	0.318	0.363	59.29	0.469	48.61
04	0.710	1.40	3.514	2,425	0.491	249	0.330				
05	0.738	1.58	3.917	2,645	0.710	250	0.314	0.335	59.94	0.454	48.46
06	0.764	1.46	3.770	2,520	0.537	259	0.331	0.406	54.46	0.483	46.79
07	0.774	1.58	3.710	2,230	0.581	218	0.332	0.434	52.60	0.516	44.69
08	0.740	1.50	3.912	2,612	0.648	246	0.309	0.330	59.47	0.432	48.94
10	0.738	1.57	3.910	2,676	0.719	253	0.323	0.344	59.24	0.452	48.47
11	0.759	1.53	4.090	2,711	0.501	261	0.316	0.336	60.04	0.431	49.81
12	0.694	1.47	3.530	2,810	0.690		0.326				
15	0.767	1.51	3.690	2,160	0.604	236	0.332	0.404	56.82	0.519	45.74
17	0.230	1.59	4.710	3,440	0.687	241	0.310	0.280	60.30	0.350	51.30
22	0.732	1.50	3.911	2,658	0.623	254	0.319	0.353	58.54	0.468	47.37
23	0.720	1.52	4.000	2,835	0.732	277	0.320	0.350	58.52	0.444	48.36
27	0.698	1.51	4.130	2,580	0.693	230	0.334	0.360	57.22	0.462	46.48
28	0.653	1.51	4.150	2,492	0.519	262	0.322	0.344	56.41	0.397	50.52
29	0.739	1.62	4.283	2,388	0.704	264	0.323	0.349	57.59	0.418	50.10
31	0.734	1.58	4.001	2,675	0.651	261	0.315	0.327	59.26	0.422	48.93
33	0.740	1.49	3.890	2,680	0.543	250	0.327	0.363	58.95	0.470	48.06
34	0.701	1.60	3.920	2,801	0.573	264	0.321	0.364	58.65	0.471	48.10
35	0.780	1.63	4.400	3,790	0.735	260	0.316				
37	0.855	1.57	3.957	2,745	0.654	243	0.324	0.378	55.94	0.448	48.71
39	0.788	1.56	4.200	2,440	0.587	239	0.326	0.336	58.55	0.424	48.70
41	0.736	1.55	3.968	2,764	0.704	248	0.314	0.326	60.68	0.457	48.47
43	0.773	1.58	3.540	2,540	0.571	216	0.336	0.472	51.86	0.567	43.30
44	0.732	1.49	4.025	2,857	0.727	256	0.314	0.322	60.55	0.452	48.26
45	0.240	1.57	4.380	3,270	0.669	237	0.326	0.310	58.90	0.380	49.70
47	1.753	1.42	3.790	2,509	0.616	225	0.333				
48	0.702	1.57	3.970	2,701	0.589	261	0.322	0.355	59.38	0.456	49.17
49	0.725	1.52	3.770	2,490	0.648	236	0.327	0.391	57.50	0.505	46.30
52	0.727	1.59	4.152	2,780	0.717	253	0.322	0.311	60.04	0.407	49.58
56	0.751	1.52	4.000	2,820	0.557	259	0.320	0.341	60.07	0.440	49.48
57	0.745	1.32	3.456	2,467	0.599	262	0.333				
58	0.712	1.46	3.740	2,810	0.750	248	0.325	0.397	56.77	0.509	46.15
60	0.771	1.45	3.520	2,620	0.549	263	0.329	0.484	51.72	0.584	43.19
62	0.751	1.55	3.830	2,650	0.574	251	0.314	0.365	59.20	0.478	47.96
65	0.718	1.36	3.516	2,556	0.668	248	0.322	1.048	46.20	1.470	30.40
66	0.642	1.52	4.460	2,709	0.414	260	0.319	0.325	58.56	0.374	52.98
68	0.710	1.49	3.740	2,784	0.648	261	0.324	0.421	54.95	0.510	46.51
69	0.751	1.46	3.560	2,954	0.627	269	0.319	0.399	56.60	0.519	46.90
70	0.762	1.48	3.645	2,239	0.584	244	0.337	0.435	53.52	0.520	45.56
76	0.708	1.57	4.330	3,010	0.365	248	0.327	0.337	57.29	0.392	50.85
77	0.410	1.51	4.280	2,790	0.816	241	0.321	0.347	57.32	0.434	47.62
78	0.720	1.46	3.770	2,710		250	0.324	0.373	57.41	0.479	46.89
81	0.712	1.49	3.760	2,740	0.750	256	0.321	0.380	56.66	0.477	46.78
83	0.345	1.51	3.985	3,115	0.583	261	0.309	0.395	55.31	0.469	48.07
85	0.710	1.61	4.230	3,010	0.364	243	0.328	0.344	57.57	0.402	51.12
87	0.703	1.53	3.920	2,700	0.631	249	0.318	0.375	56.27	0.447	48.68
89	0.754	1.50	3.900	2,220	0.665	245	0.328	0.364	58.66	0.473	47.47
90	0.654	1.50	4.260	2,770	0.438	254	0.314	0.356	57.27	0.416	50.57
93	0.720	1.48	3.890	2,652	0.746	268	0.321	0.383	57.42	0.486	47.05
94	0.755	1.49	3.770	2,374	0.004	156	0.263	0.394	57.91	0.515	46.88
95	0.728	1.56	4.180	2,819	0.442	252	0.332	0.370	58.70	0.460	48.30
99	0.657	1.55	4.180	2,561	0.496	245	0.328	0.367	56.99	0.432	50.06
Average	0.715	1.52	3.946	2,697	0.601	248	0.321	0.382	57.05	0.480	47.59
Std. Dev.	0.188	0.06	0.273	281	0.124	18	0.011	0.098	2.71	0.142	3.00
Coef. of Var.	26.266	3.97	6.913	10	20.651	7	3.280	25.738	4.75	29.486	6.31

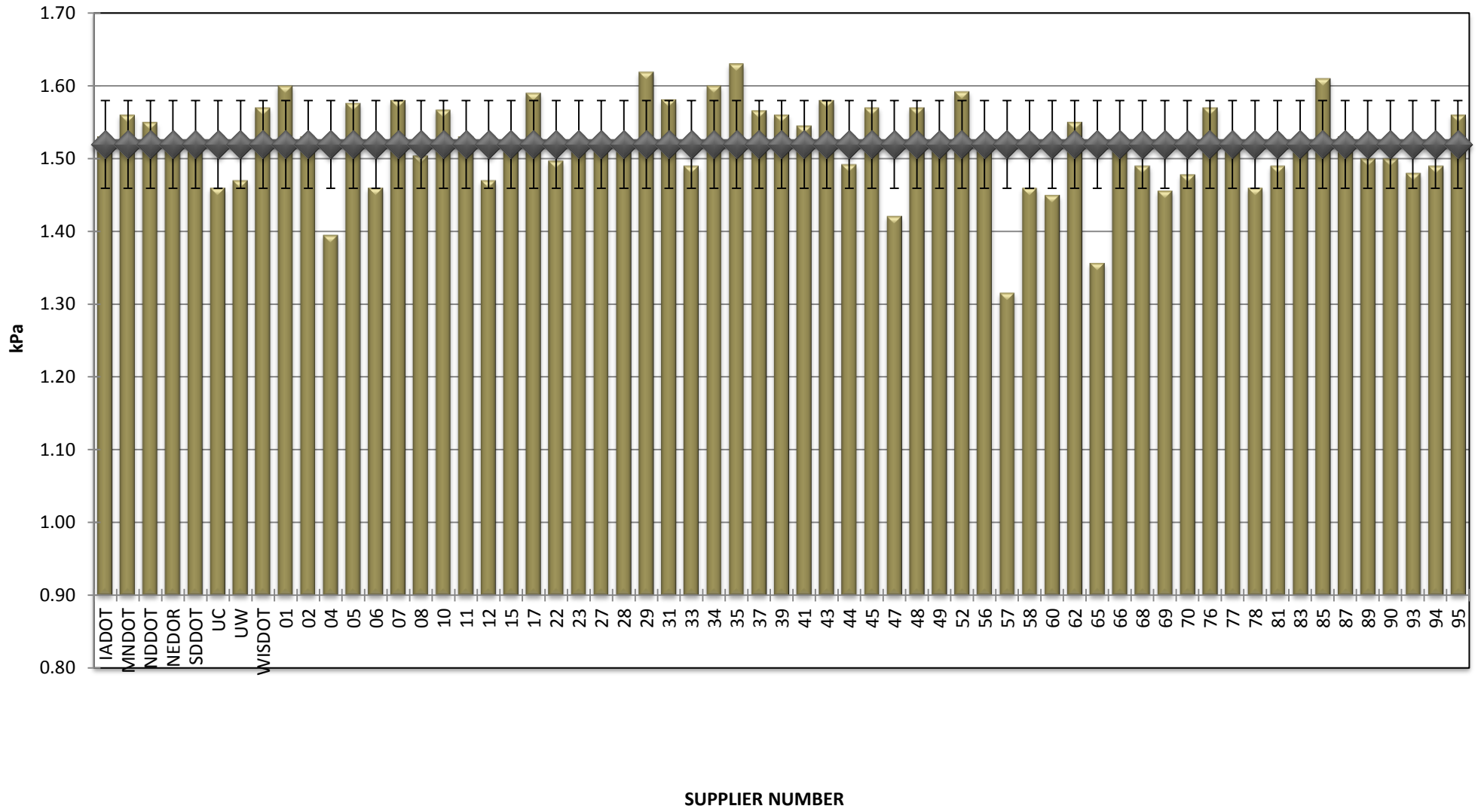
**COMBINED STATE BINDER GROUP ROUND ROBIN  
SUMMARY A 2016-1  
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**ROTATIONAL VISCOSITY**



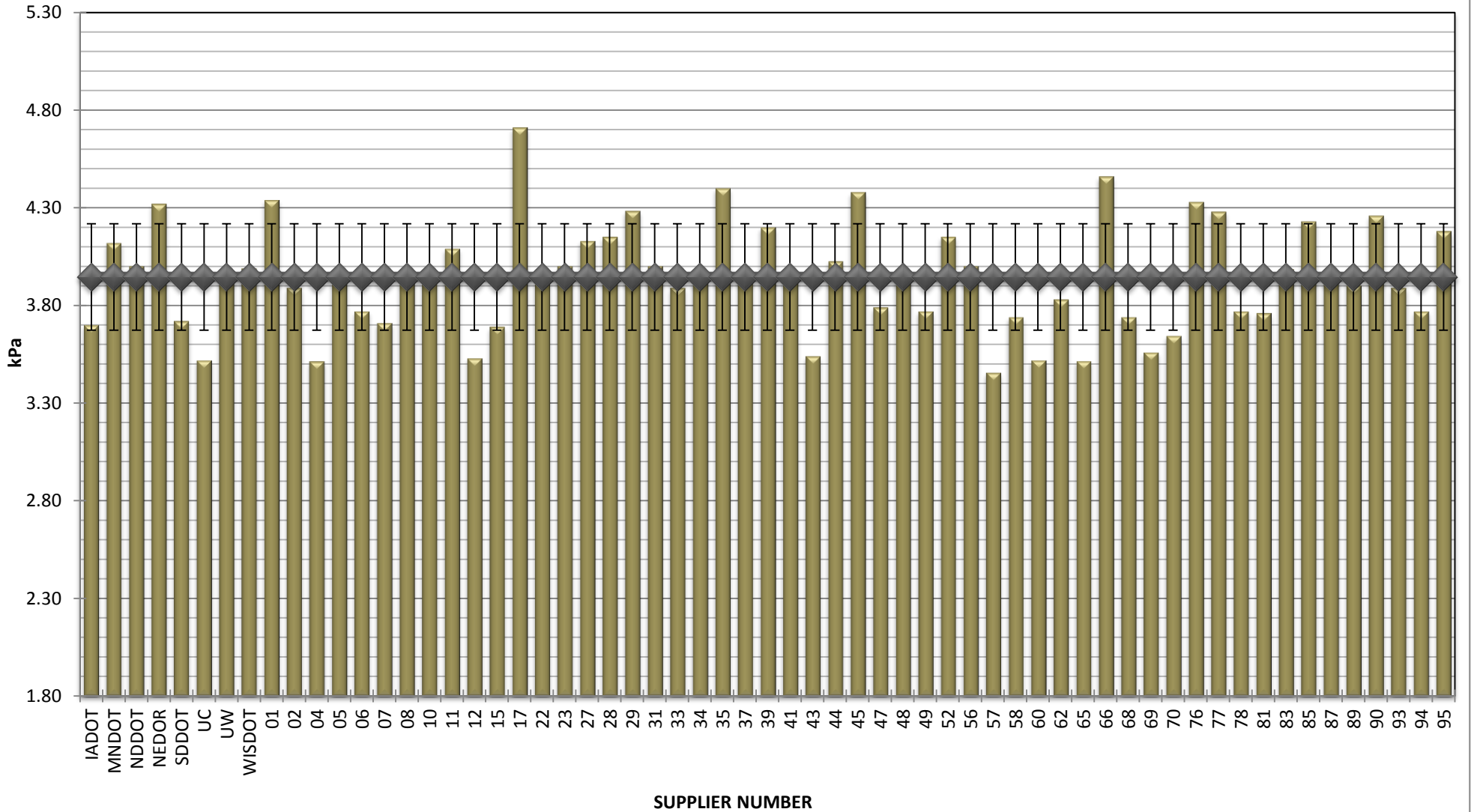
**COMBINED STATE BINDER GROUP ROUND ROBIN  
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**DSR - ORIGINAL**



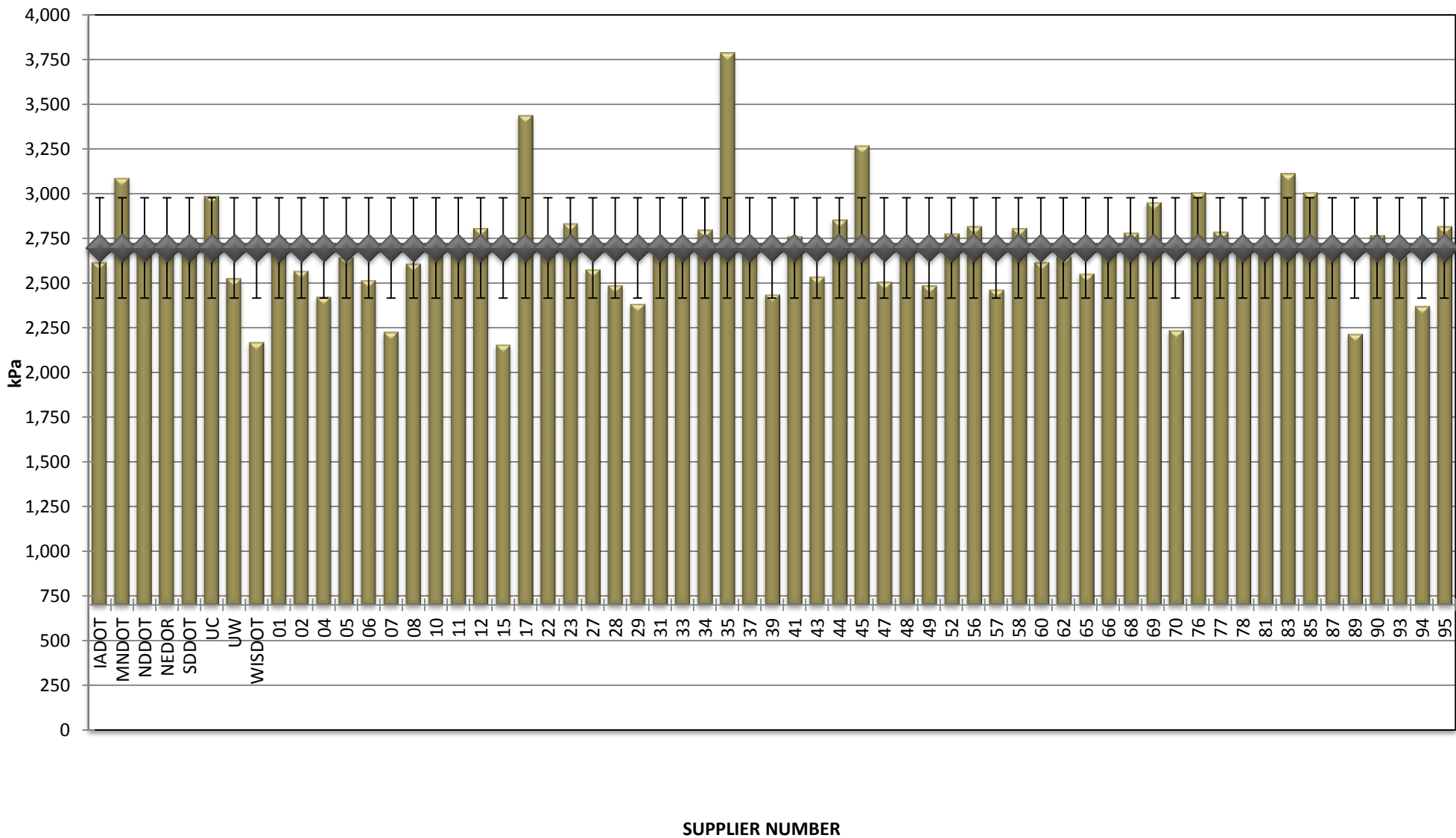
**COMBINED STATE BINDER GROUP ROUND ROBIN  
SUMMARY A 2016-1  
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**DSR - RTFO**



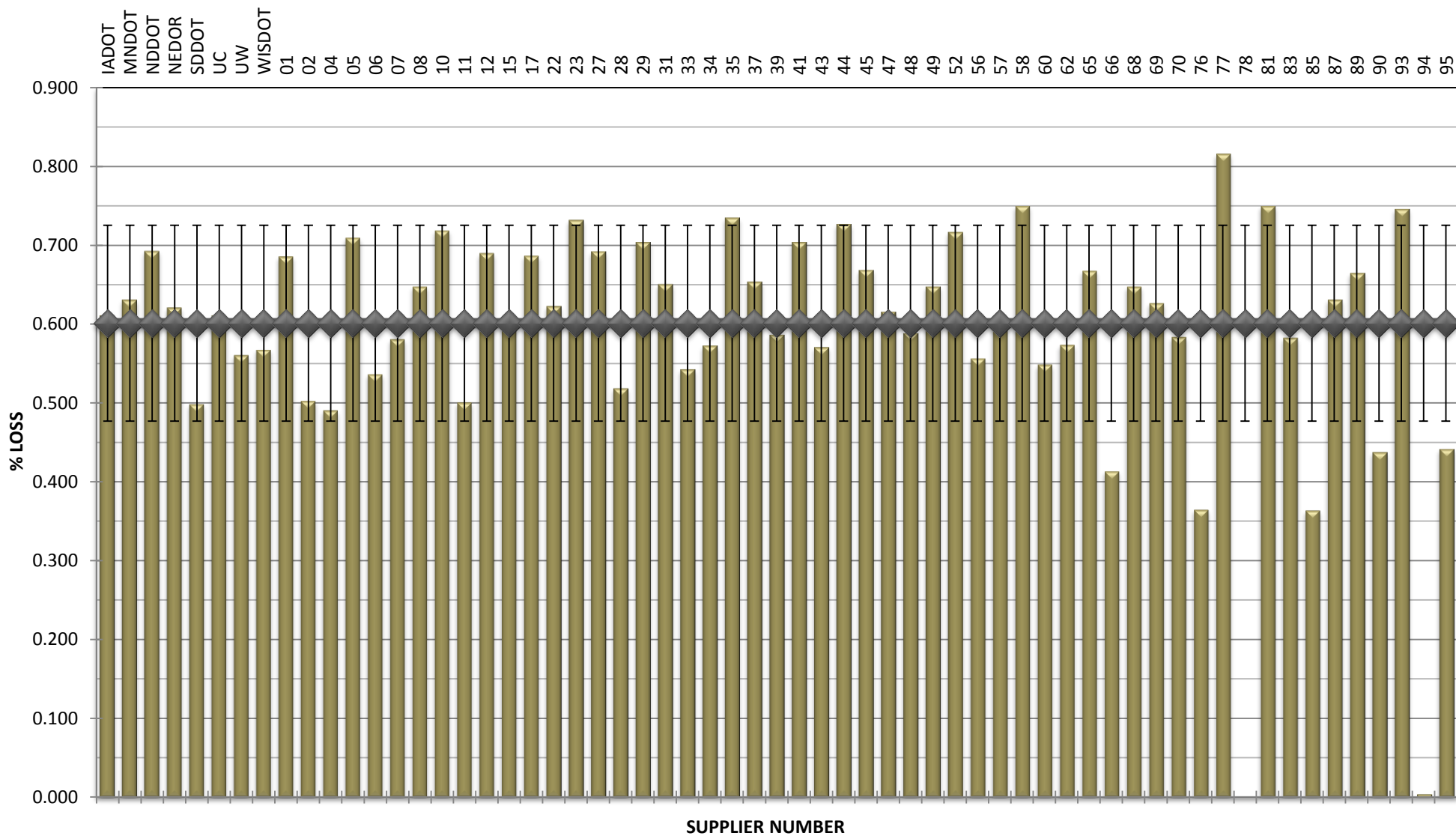
**COMBINED STATE BINDER GROUP ROUND ROBIN  
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**DSR - PAV**



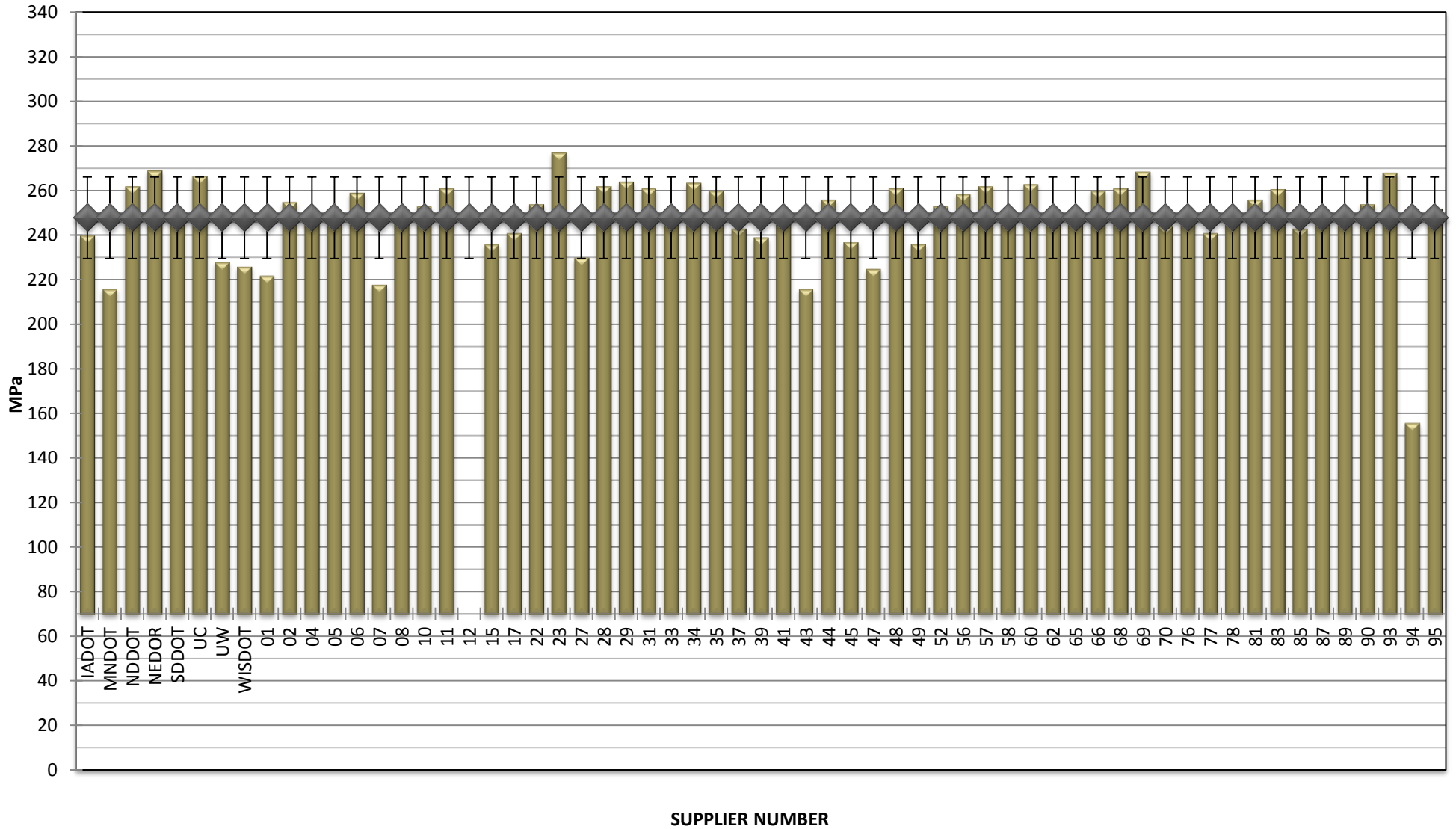
**COMBINED STATE BINDER GROUP ROUND ROBIN  
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**RTFO MASS LOSS**



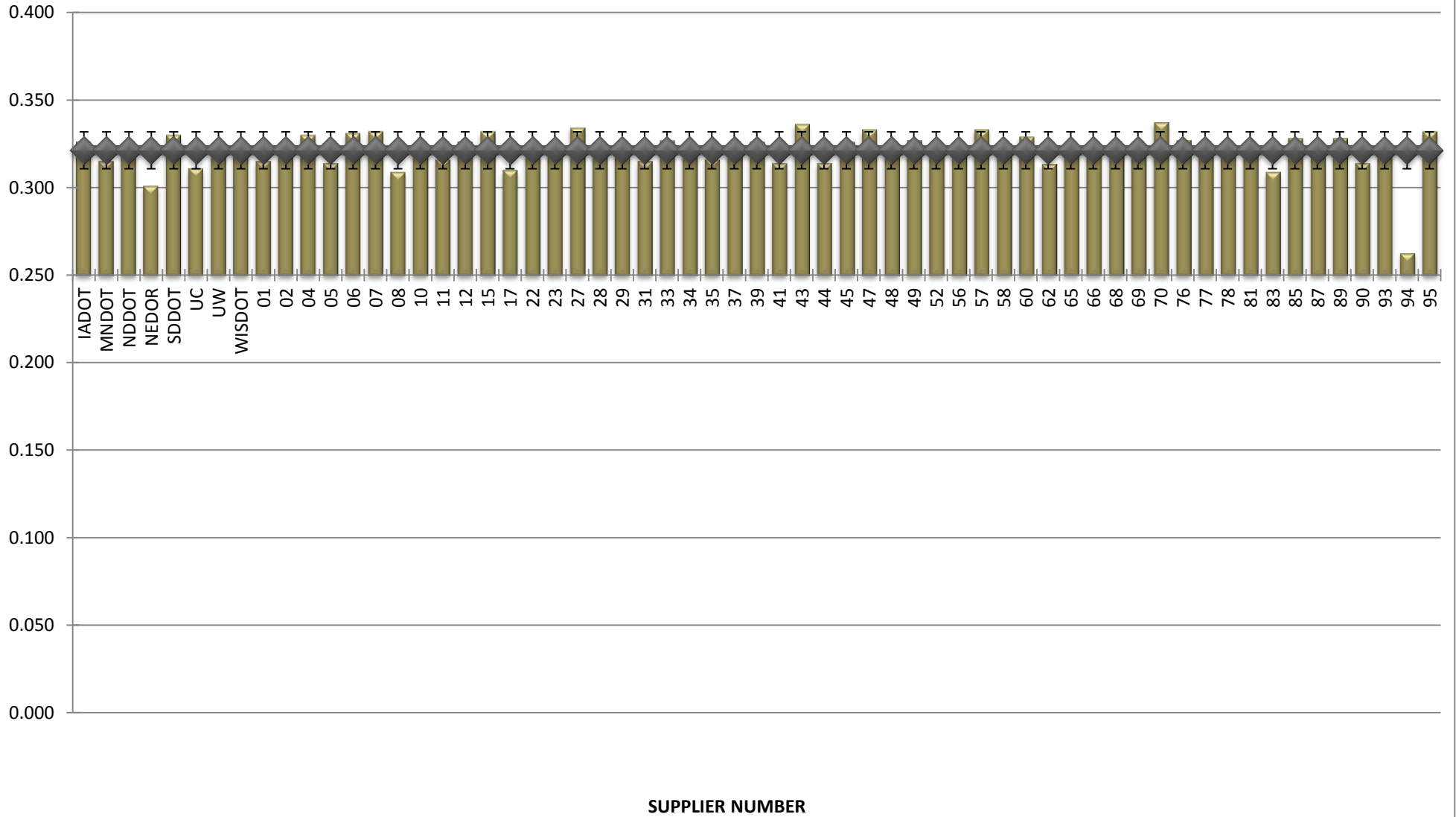
**COMBINED STATE BINDER GROUP ROUND ROBIN  
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**BBR STIFFNESS**



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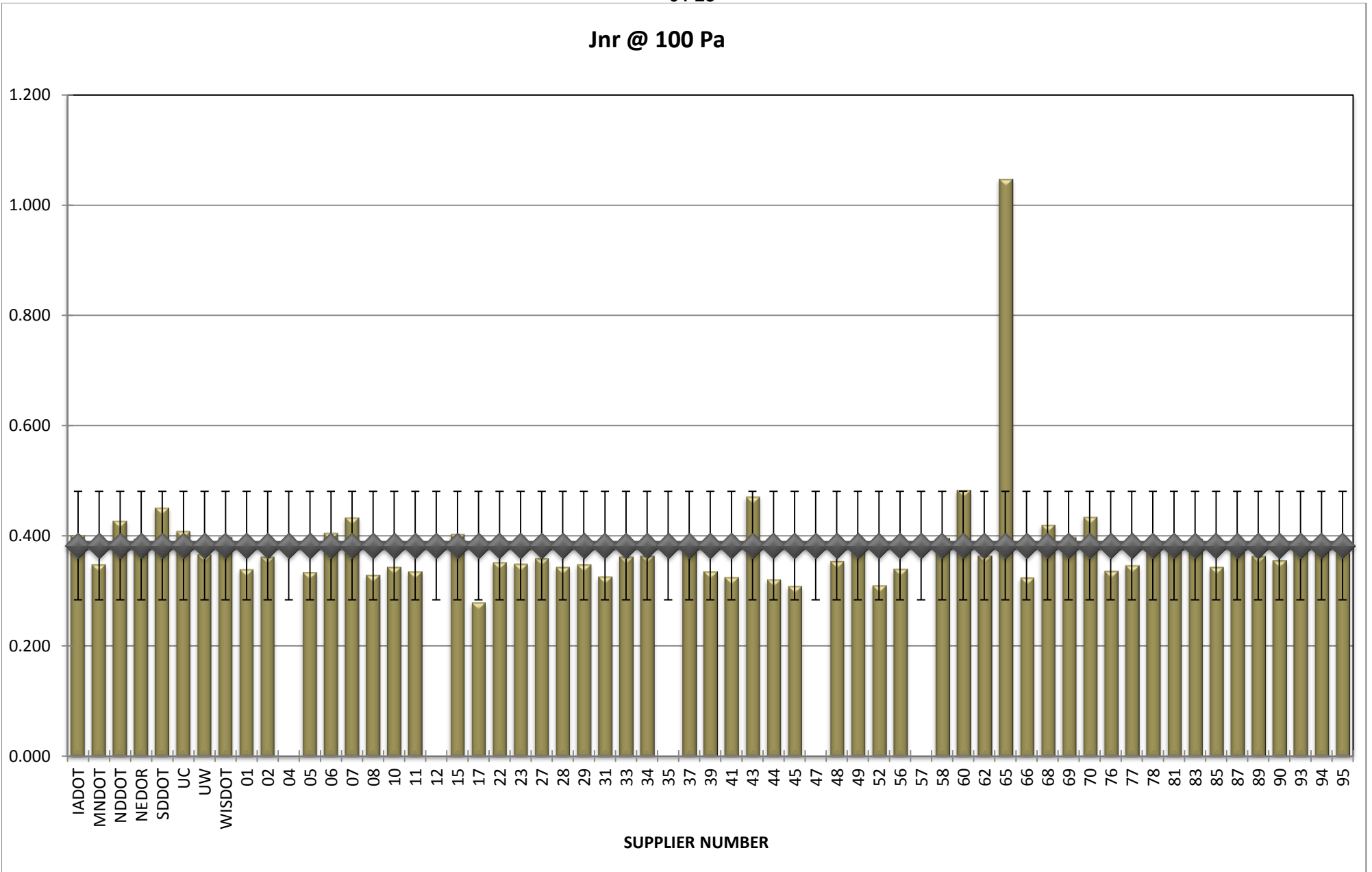
**BBR m-VALUE**





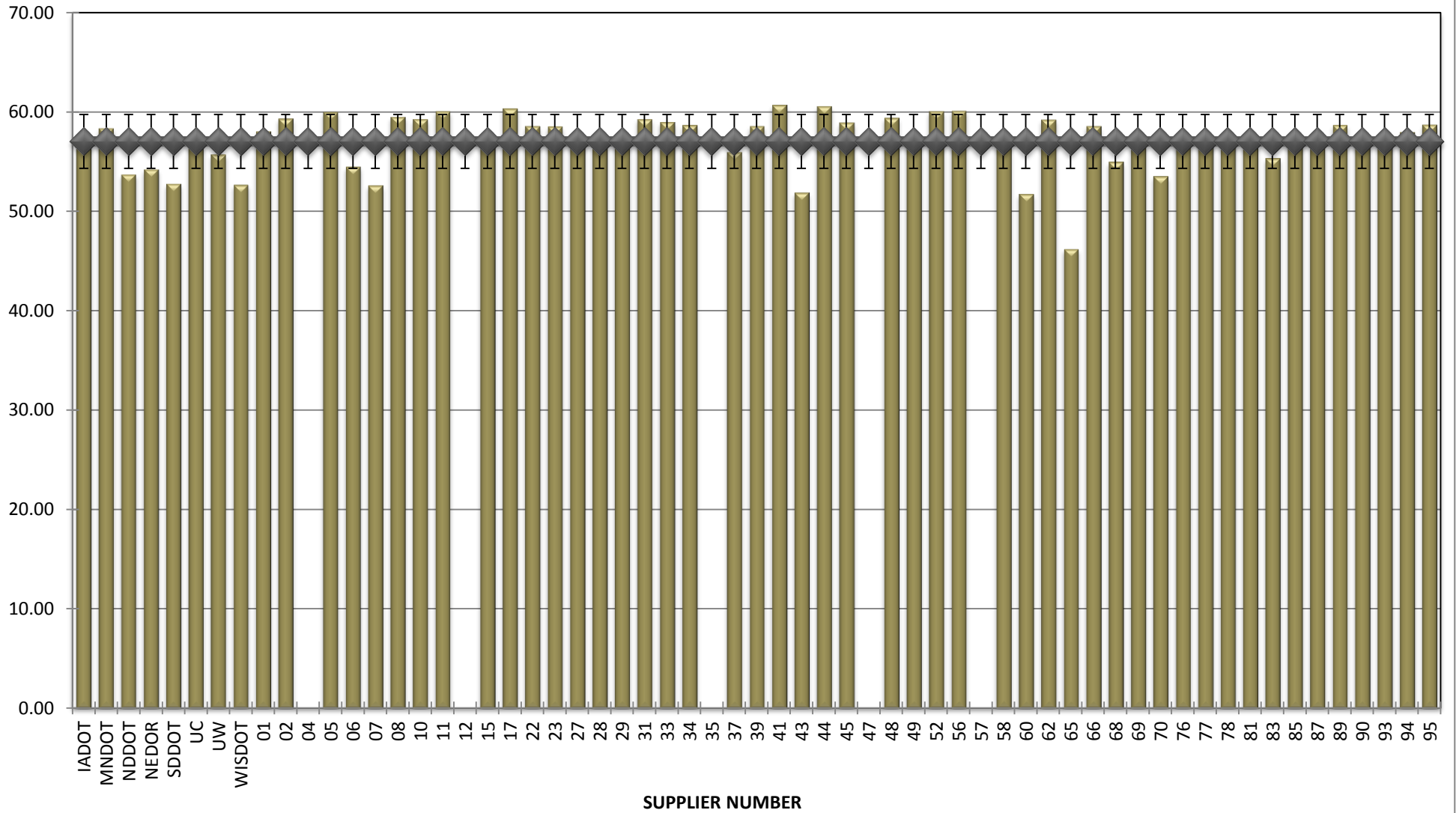
**COMBINED STATE BINDER GROUP ROUND ROBIN  
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**Jnr @ 100 Pa**



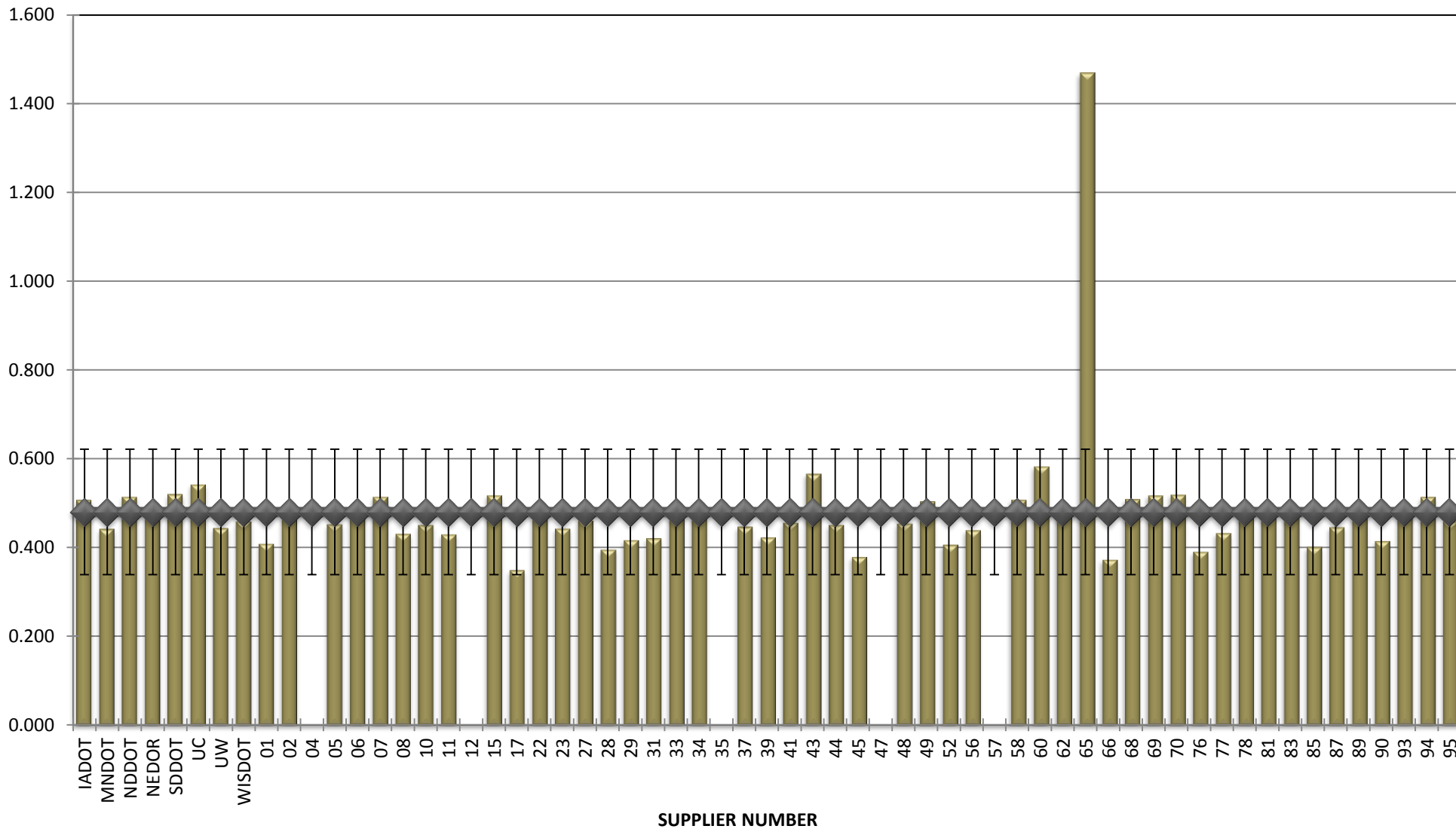
**COMBINED STATE BINDER GROUP ROUND ROBIN  
SUMMARY A 2016-1  
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**% Recovery @ 100 Pa**



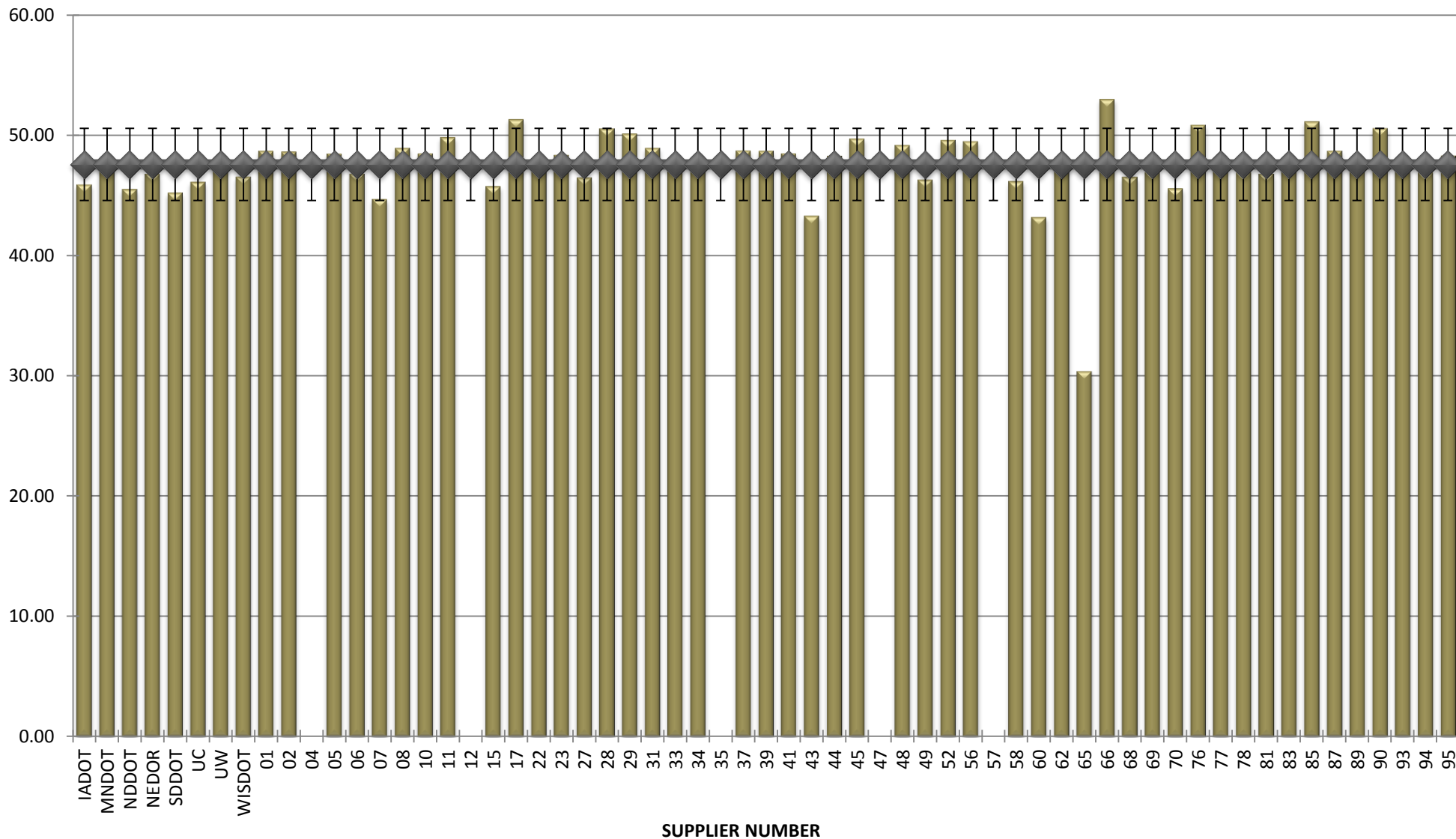
**COMBINED STATE BINDER GROUP ROUND ROBIN  
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**Jnr @ 3200 Pa**



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



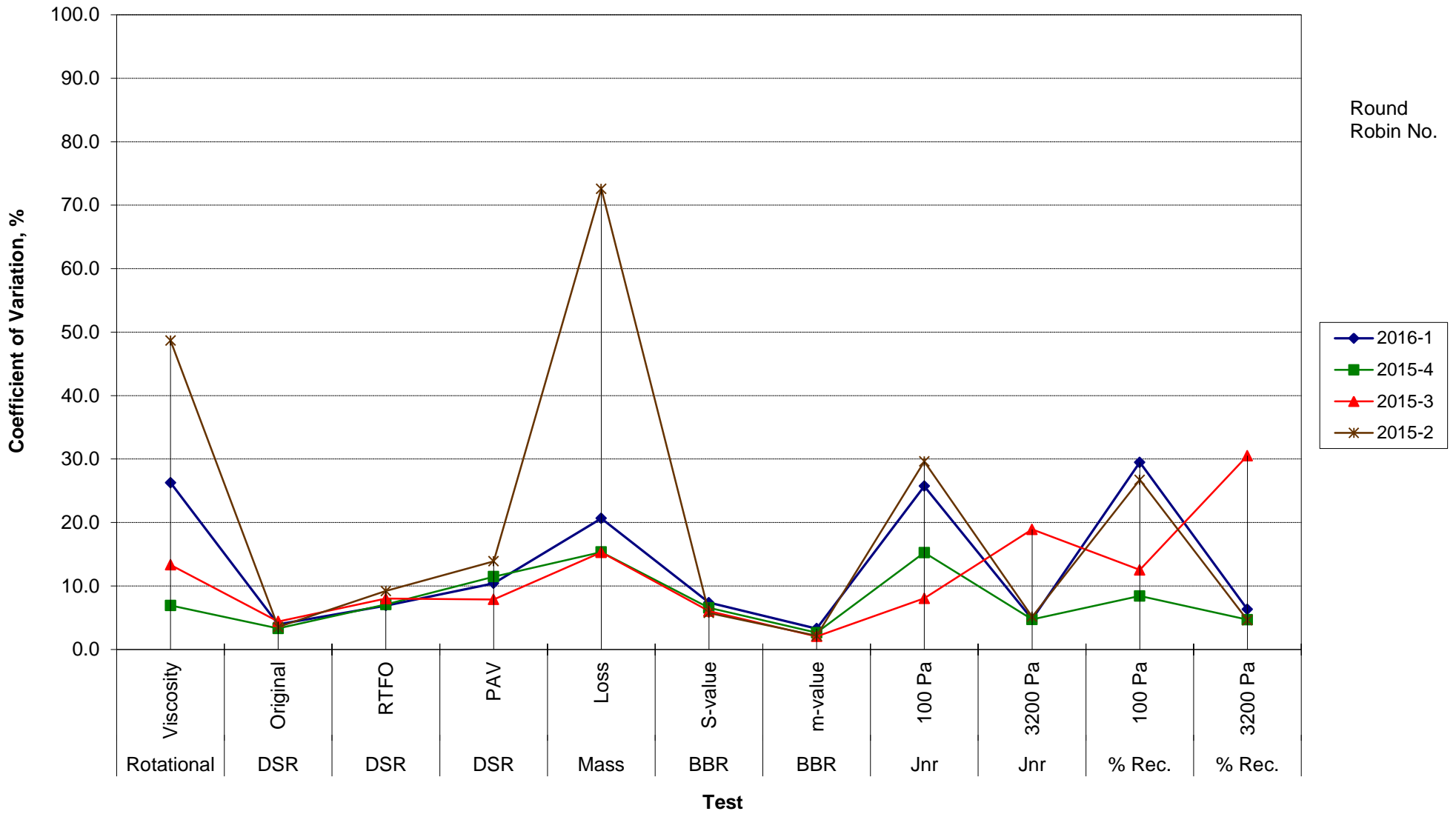
**COMBINED STATE BINDER GROUP ROUND ROBIN  
SUMMARY A**

**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
2016-1	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
2015-3	69	13.336	4.415	8.017	7.886	15.285	6.039	2.054	8.054	18.907	12.535	30.539	50.366
2015-2	66	48.681	3.526	9.208	13.885	72.575	5.751	2.143	29.617	5.155	26.721	4.610	36.643

**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>	0.698	1.52	3.95	2,679	0.601	249	0.322	0.370	57.24	0.462	47.90
<b>Std. Dev.</b>	0.2159	0.0621	0.2746	284.27	0.1487	37.06	0.0109	0.1464	16.3838	0.1906	13.4632
<b>Coef. of Var.</b>	30.933	4.077	6.960	10.613	24.727	14.864	3.384	39.534	28.622	41.237	28.108

**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