Regional Technical Services
Polymer Analytics & Physics

Date: September 29, 2017

Subject: 17P1347 - GPC Molecular Weight Distribution of Vorstufe 2342 for TSCA Registration

To: L. Gindin

From: D. Mullen

Analytical Overview:

A sample of Vorstufe 2342 polyester was analyzed for molecular weight distribution by gel permeation chromatography for TSCA registration. The area percent below 1000 and 500 Daltons were also calculated for the PMN filing.

Results:

MWD data was obtained by using a calibration relative to polyethylene glycol standards and a peak position calibration method. Attached is a chromatogram showing the MWD and molecular weight slices at 1000 and 500 Daltons. Also included are the associated calibration curve and peak molecular weight slice table.

Sample	Mn	Mw	Mw/Mn	Area % <1000 Da	Area % <500 Da
Vorstufe 2342	850 (10)	1,040 (10)	1.22	52.7 (0.1)	5.6 (0.1)

( ) Standard deviation is based on three injections of one weighed sample.

Instrument Parameters:

A Waters Alliance Gel Permeation Chromatograph was used to perform the separation. The data analysis was done using Empower3 software. The chromatographic conditions were:

Temperature: 30°C, columns & detector
Flow Rate: 1.0 ml/min.
Detector: Waters 2414 RI
Injection Volume: 75µl
Sample Concentration: 0.7%
Solvent: Chloroform
Flow Standard: Negative solvent peak
Sensitivity: 4
Operating Pressure: 1810 psi
Columns: PL Gel; SDVB; 3µm Pore dia: 1xMixed-E + 5µm Pore dia: 2xMixed-D

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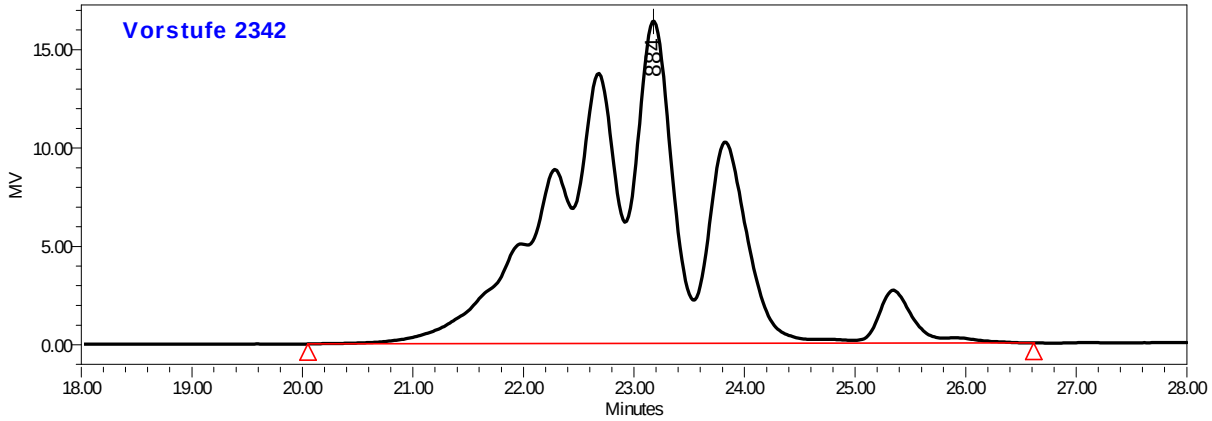
GPC Individual MWD_Slice_DLM Report

Reported by User: Diana Mullen (dianamullen) Project Name: GPC_Chloro_Polyol_1_17

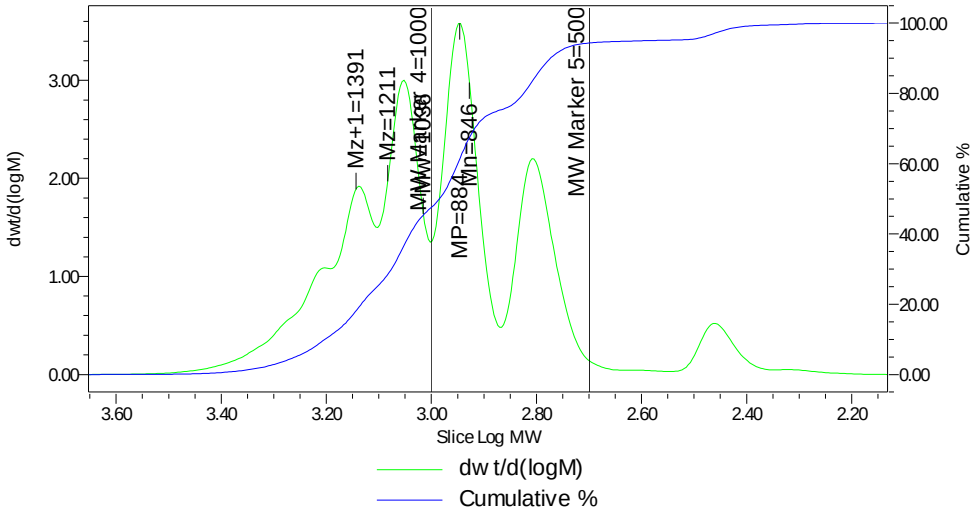
SAMPLE INFORMATION

Sample Name:	Vorstufe 2342	Acquired By:	mattw alker
Sample Type:	Broad Unknow n	Date Acquired:	9/27/2017 6:38:48 PM EDT
Vial:	7	Acq. Method Set:	Polyols_PEG Stds 30 Degrees
Injection #:	2	Date Processed:	9/29/2017 1:54:20 PM EDT
Injection Volume:	75.00 ul	Processing Method	GPC Chloro 9_14_17 PMN_dm
Run Time:	40.0 Minutes	Channel Name:	410
Sample Set Name:	17P1315_16_17_42_1343	Proc. Chnl. Descr.:	410



GPC Results

	Name	Retention Time	Mn	MP	Mw	Mz	Polydispersity	%Poly < 1000	%Poly < 500
1	Broad	23.177	846	884	1036	1211	1.224	52.715	5.651
2	Reference	32.192							



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GPC Individual MWD_Slice_DLM Report

Reported by User: Diana Mullen (dianamullen) Project Name: GPC_Chloro_Polyol_1_17

GPC Distribution Table

Mp: 884 Name: Broad

	Slice RT	Slice MW	Slice Log MW	Slice Area	Cumulative %	dwt/d(log M)	Outside Vo-Vt
1	21.248	2326	3.366588	12809	1.000	0.156952	No
2	21.439	2106	3.323541	12809	2.000	0.286272	No
3	21.562	1977	3.295925	12809	3.000	0.413633	No
4	21.652	1888	3.275915	12809	4.000	0.527316	No
5	21.729	1815	3.258884	12809	5.000	0.593531	No
6	21.797	1754	3.244008	12809	6.000	0.695768	No
7	21.853	1705	3.231708	12809	7.000	0.840294	No
8	21.900	1664	3.221257	12809	8.000	0.965100	No
9	21.944	1628	3.211756	12809	9.000	1.034708	No
10	21.986	1594	3.202538	12809	10.000	1.051870	No
11	22.028	1561	3.193292	12809	11.000	1.044217	No
12	22.071	1528	3.184117	12809	12.000	1.065400	No
13	22.110	1498	3.175513	12809	13.000	1.156549	No
14	22.146	1472	3.167837	12809	14.000	1.303794	No
15	22.177	1449	3.161074	12809	15.000	1.469314	No
16	22.205	1429	3.154987	12809	16.000	1.621050	No
17	22.231	1410	3.149362	12809	17.000	1.742344	No
18	22.256	1393	3.144019	12809	18.000	1.820593	No
19	22.280	1377	3.138793	12809	19.000	1.854698	No
20	22.304	1360	3.133550	12809	20.000	1.842273	No
21	22.329	1343	3.128165	12809	21.000	1.785367	No
22	22.355	1326	3.122508	12809	22.000	1.693088	No
23	22.383	1308	3.116496	12809	23.000	1.583040	No
24	22.413	1288	3.110065	12809	24.000	1.488902	No
25	22.444	1269	3.103411	12809	25.000	1.449998	No
26	22.474	1250	3.096887	12809	26.000	1.499280	No
27	22.503	1233	3.090820	12809	27.000	1.628291	No
28	22.528	1217	3.085388	12809	28.000	1.812096	No
29	22.551	1204	3.080495	12809	29.000	2.015505	No
30	22.571	1192	3.076109	12809	30.000	2.214292	No
31	22.590	1180	3.072062	12809	31.000	2.397673	No
32	22.608	1170	3.068274	12809	32.000	2.558242	No
33	22.624	1161	3.064677	12809	33.000	2.690158	No
34	22.641	1151	3.061213	12809	34.000	2.791526	No
35	22.656	1142	3.057832	12809	35.000	2.860487	No
36	22.672	1134	3.054491	12809	36.000	2.895938	No
37	22.688	1125	3.051151	12809	37.000	2.896989	No
38	22.703	1116	3.047770	12809	38.000	2.862152	No
39	22.720	1107	3.044306	12809	39.000	2.793196	No
40	22.736	1098	3.040707	12809	40.000	2.687698	No

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GPC Individual MWD_Slice_DLM Report

Reported by User: Diana Mullen (dianamullen) Project Name: GPC_Chloro_Polyol_1_17

GPC Distribution Table

Mp: 884 Name: Broad

	Slice RT	Slice MW	Slice Log MW	Slice Area	Cumulative %	dwt/d(log M)	Outside Vo-Vt
41	22.754	1089	3.036911	12809	41.000	2.546554	No
42	22.773	1079	3.032841	12809	42.000	2.369364	No
43	22.794	1068	3.028406	12809	43.000	2.160142	No
44	22.817	1056	3.023499	12809	44.000	1.925545	No
45	22.843	1042	3.017844	12809	45.000	1.678828	No
46	22.873	1027	3.011400	12809	46.000	1.456075	No
47	22.907	1010	3.004224	12809	47.000	1.323223	No
48	22.941	993	2.996927	12809	48.000	1.340685	No
49	22.972	978	2.990273	12809	49.000	1.499119	No
50	22.999	965	2.984511	12809	50.000	1.736550	No
51	23.022	954	2.979610	12809	51.000	2.000314	No
52	23.042	945	2.975293	12809	52.000	2.260699	No
53	23.060	936	2.971411	12809	53.000	2.503264	No
54	23.077	929	2.967858	12809	54.000	2.721881	No
55	23.092	922	2.964547	12809	55.000	2.913441	No
56	23.107	915	2.961413	12809	56.000	3.076593	No
57	23.121	909	2.958408	12809	57.000	3.211989	No
58	23.135	903	2.955496	12809	58.000	3.321040	No
59	23.148	897	2.952660	12809	59.000	3.397741	No
60	23.161	891	2.949859	12809	60.000	3.443816	No
61	23.174	885	2.947066	12809	61.000	3.463469	No
62	23.187	880	2.944266	12809	62.000	3.456740	No
63	23.200	874	2.941440	12809	63.000	3.422926	No
64	23.214	868	2.938542	12809	64.000	3.353282	No
65	23.228	862	2.935556	12809	65.000	3.255580	No
66	23.242	856	2.932451	12809	66.000	3.128450	No
67	23.257	850	2.929187	12809	67.000	2.970573	No
68	23.274	843	2.925705	12809	68.000	2.780608	No
69	23.291	835	2.921930	12809	69.000	2.556676	No
70	23.311	827	2.917756	12809	70.000	2.297188	No
71	23.333	819	2.913045	12809	71.000	2.001908	No
72	23.359	808	2.907388	12809	72.000	1.662538	No
73	23.392	795	2.900340	12809	73.000	1.282703	No
74	23.437	777	2.890576	12809	74.000	0.866269	No
75	23.511	749	2.874686	12809	75.000	0.497825	No
76	23.599	717	2.855755	12809	76.000	0.606711	No
77	23.652	699	2.844201	12809	77.000	0.978971	No
78	23.688	686	2.836310	12809	78.000	1.315294	No
79	23.718	676	2.829970	12809	79.000	1.591064	No
80	23.743	668	2.824528	12809	80.000	1.801684	No

Report Method: GPC Individual MWD_Slice_D Printed 4:09:17 PM 10/29/2017

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GPC Individual MWD_Slice_DLM Report

Reported by User: Diana Mullen (dianamullen) Project Name: GPC_Chloro_Polyol_1_17

GPC Distribution Table

Mp: 884 Name: Broad

	Slice RT	Slice MW	Slice Log MW	Slice Area	Cumulative %	dwt/d(log M)	Outside Vo-Vt
81	23.766	660	2.819521	12809	81.000	1.960295	No
82	23.788	653	2.814819	12809	82.000	2.062685	No
83	23.809	646	2.810244	12809	83.000	2.116636	No
84	23.829	639	2.805699	12809	84.000	2.127430	No
85	23.851	633	2.801100	12809	85.000	2.097519	No
86	23.872	626	2.796340	12809	86.000	2.025952	No
87	23.895	619	2.791350	12809	87.000	1.921558	No
88	23.920	611	2.786003	12809	88.000	1.784322	No
89	23.947	603	2.780135	12809	89.000	1.616080	No
90	23.977	594	2.773522	12809	90.000	1.420512	No
91	24.012	583	2.765827	12809	91.000	1.197937	No
92	24.055	571	2.756335	12809	92.000	0.941997	No
93	24.114	554	2.743361	12809	93.000	0.641788	No
94	24.220	525	2.719841	12809	94.000	0.277073	No
95	24.769	394	2.595997	12809	95.000	0.040941	No
96	25.247	305	2.484120	12809	96.000	0.359140	No
97	25.334	291	2.463173	12809	97.000	0.503669	No
98	25.418	277	2.442805	12809	98.000	0.433008	No
99	25.552	257	2.409966	12809	99.000	0.193185	No
100	26.600	137	2.136290	12809	100.000	0.000782	No

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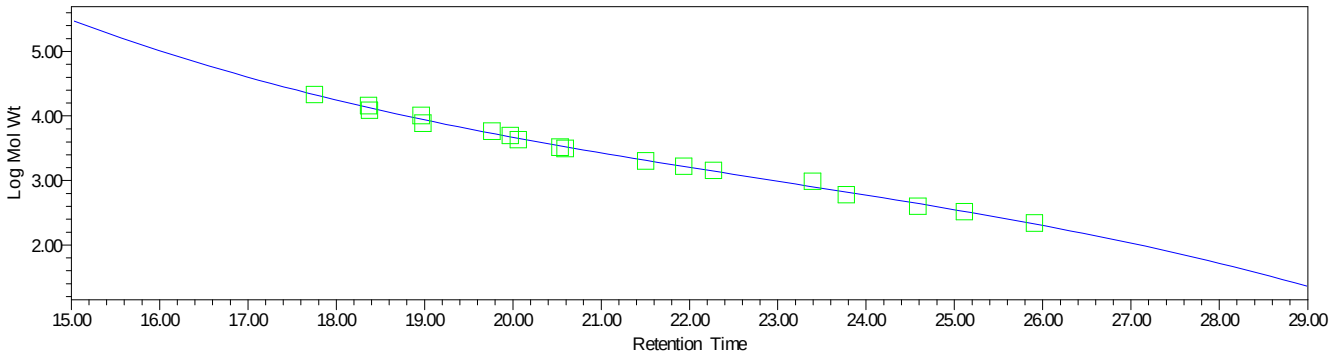
Calibration_DMC Report

Reported by User: Diana Mullen (dianamullen) Project Name: GPC_Chloro_Polyol_1_17

SAMPLE INFORMATION

Sample Name:	PEG Std 1	Acquired By:	mattw alker
Sample Type:	Narrow Standard	Date Acquired:	9/13/2017 10:30:20 AM EDT
Vial:	2	Acq. Method Set:	Polyols_PEG Stds 30 Degrees
Injection #:	1	Date Processed:	9/14/2017 12:36:44 PM EDT
Injection Volume:	75.00 ul	Processing Method:	GPC Chloro 9_14_17 MWD_MW
Run Time:	40.0 Minutes	Channel Name:	410
Sample Set Name:	17P1261_82_89_90_91_1292	Proc. Chnl. Descr.:	410

GPC Calibration Plot



GPC Calibration Table

	Mol Wt (Daltons)	RT (min)	Calculated Weight (Daltons)	% Residual
1	21500	17.753	21424	0.356
2	7750	18.982	8822	-12.155
3	3300	20.533	3452	-4.395
4	1430	22.272	1395	2.478
5	400	24.586	439	-8.944
6	14500	18.367	13499	7.414
7	5800	19.762	5390	7.609
8	3140	20.592	3341	-6.011
9	975	23.393	803	21.494
10	330	25.111	332	-0.675
11	12300	18.375	13419	-8.339
12	5000	19.970	4762	5.000
13	2010	21.503	2057	-2.301
14	220	25.907	212	3.682
15	10225	18.961	8945	14.307
16	4300	20.061	4517	-4.802
17	1670	21.933	1653	1.032
18	600	23.777	663	-9.512

Report Method: Calibration_DMC Printed 12:48:55 PM10/2/2017

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