

MVTR Interlab Testing - SMTL/SDMA - 2013 - PID/4319

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1 Introduction

This document details an interlaboratory testing project in 2013 between SMTL and SDMA members.

SMTL had reported previously that high MVTR dressings, when tested using the 'fluid in contact' method in EN 13726-1, Monograph 3.3 (Fluid handling capacity) and EN 13726-2 Monograph 3.3 (MVTR of a wound dressing when in contact with liquid), caused doming of the dressing into the test chamber. It was suspected that this doming artificially increased the reported MVTR and FHC due to stretching of the dressing.

At the SDMA meeting on 12th June 2012, there was agreement that the SMTL proposal to include small vent holes in the Paddington cups seemed sensible, as it may prevent the doming observed with high MVTR dressings.

SMTL noted that some data is available to demonstrate that a hole of approximately 0.3mm diameter eliminates doming and does not affect the FHC or MVTR results. It was agreed that work should be undertaken to investigate this. A series of experiments were discussed and agreed between SMTL and SDMA members over the Winter 2012/Spring 2013, and a test programme was run in 2013.

This document presents the results and an analyses of these experiments.

2 Results

2.1 VH1 Experiments

To measure the amount of moisture vapour which is lost from the test cup when a vented lid is used, which is not in contact with the fluid. In addition to generate control data for cups with no dressing and no vented lid - i.e., completely sealed.

2.1.1 Experiment Notes

LabE Two novent runs repeated due to suspected leaks.

LabC A four-decimal place balance was not available, and so experiments were not undertaken

sampno	lidtype	temp	rh	w1	w2	ml	lab
1	novent	36.3 to 37.4	8.1 to 9.8	183.756	183.750	0.0064	LabA
2	novent	36.3 to 37.4	8.1 to 9.8	183.770	183.763	0.0067	LabA
3	novent	36.3 to 37.4	8.1 to 9.8	183.329	183.317	0.0125	LabA
4	novent	36.3 to 37.4	8.1 to 9.8	183.160	183.149	0.0106	LabA
5	novent	36.3 to 37.4	8.1 to 9.8	182.962	182.953	0.0084	LabA
6	novent	36.3 to 37.4	8.1 to 9.8	184.457	184.443	0.0135	LabA
7	novent	36.3 to 37.4	8.1 to 9.8	184.000	183.991	0.0088	LabA
8	novent	36.3 to 37.4	8.1 to 9.8	184.543	184.528	0.0151	LabA

sampno	lidtype	temp	rh	w1	w2	ml	lab
9	novent	36.3 to 37.4	8.1 to 9.8	184.247	184.239	0.0078	LabA
10	novent	36.3 to 37.4	8.1 to 9.8	183.748	183.738	0.0094	LabA
1	vent	36.3 to 37.4	8.1 to 9.8	181.168	181.106	0.0620	LabA
2	vent	36.3 to 37.4	8.1 to 9.8	182.620	182.609	0.0108	LabA
3	vent	36.3 to 37.4	8.1 to 9.8	182.435	182.423	0.0116	LabA
4	vent	36.3 to 37.4	8.1 to 9.8	183.264	183.202	0.0616	LabA
5	vent	36.3 to 37.4	8.1 to 9.8	183.152	183.123	0.0295	LabA
6	vent	36.3 to 37.4	8.1 to 9.8	183.134	183.102	0.0321	LabA
7	vent	36.3 to 37.4	8.1 to 9.8	183.537	183.467	0.0699	LabA
8	vent	36.3 to 37.4	8.1 to 9.8	184.283	184.273	0.0096	LabA
9	vent	36.3 to 37.4	8.1 to 9.8	184.141	184.134	0.0076	LabA
10	vent	36.3 to 37.4	8.1 to 9.8	184.519	184.509	0.0095	LabA
1	novent	36.0 - 38.0	2.9 - 7.6	287.204	287.180	0.0240	LabB
2	novent	36.0 - 38.0	2.9 - 7.6	287.162	287.149	0.0125	LabB
3	novent	36.0 - 38.0	2.9 - 7.6	287.894	287.886	0.0088	LabB
4	novent	36.0 - 38.0	2.9 - 7.6	287.618	287.604	0.0142	LabB
5	novent	36.0 - 38.0	2.9 - 7.6	287.920	287.910	0.0098	LabB
6	novent	36.0 - 38.0	2.9 - 7.6	287.262	287.252	0.0093	LabB
7	novent	36.0 - 38.0	2.9 - 7.6	286.955	286.946	0.0089	LabB
8	novent	36.0 - 38.0	2.9 - 7.6	287.524	287.514	0.0109	LabB
9	novent	36.0 - 38.0	2.9 - 7.6	287.312	287.301	0.0111	LabB
10	novent	36.0 - 38.0	2.9 - 7.6	286.975	286.964	0.0111	LabB
1	vent	36.0 - 38.0	2.9 - 7.6	287.534	287.508	0.0258	LabB
2	vent	36.0 - 38.0	2.9 - 7.6	287.259	287.219	0.0401	LabB
3	vent	36.0 - 38.0	2.9 - 7.6	287.767	287.748	0.0192	LabB
4	vent	36.0 - 38.0	2.9 - 7.6	287.959	287.937	0.0225	LabB
5	vent	36.0 - 38.0	2.9 - 7.6	286.792	286.769	0.0228	LabB
6	vent	36.0 - 38.0	2.9 - 7.6	287.467	287.446	0.0212	LabB
7	vent	36.0 - 38.0	2.9 - 7.6	288.278	288.255	0.0230	LabB
8	vent	36.0 - 38.0	2.9 - 7.6	288.127	288.104	0.0235	LabB
9	vent	36.0 - 38.0	2.9 - 7.6	286.743	286.726	0.0165	LabB
10	vent	36.0 - 38.0	2.9 - 7.6	287.155	287.137	0.0184	LabB
1	novent	36.4 - 36.3	17	180.741	180.682	0.0582	LabD
2	novent	36.4 - 36.3	17	198.337	198.325	0.0127	LabD
3	novent	36.4 - 36.3	17	188.763	188.753	0.0099	LabD
4	novent	36.4 - 36.3	17	192.243	192.224	0.0191	LabD
5	novent	36.4 - 36.3	17	196.084	196.073	0.0119	LabD
6	novent	36.4 - 36.3	17	194.131	194.119	0.0119	LabD
7	novent	35.8 - 35.9	18	199.043	199.037	0.0063	LabD
8	novent	35.8 - 35.9	18	196.154	196.028	0.1254	LabD
9	novent	35.8 - 35.9	18	184.862	184.783	0.0791	LabD
10	novent	35.8 - 35.9	18	190.002	189.991	0.0110	LabD
1	vent	35.9	18-17	197.660	197.650	0.0103	LabD
2	vent	35.9	18 - 17	193.316	193.304	0.0114	LabD
3	vent	35.9	18 - 17	192.393	192.366	0.0275	LabD
4	vent	35.9	18 - 17	189.387	189.350	0.0369	LabD
5	vent	35.9	18 - 17	189.465	189.453	0.0124	LabD
6	vent	35.9	18 - 17	193.379	193.368	0.0110	LabD
7	vent	35.9	18 - 17	198.206	198.196	0.0094	LabD
8	vent	35.9	18 - 17	197.535	197.523	0.0127	LabD
9	vent	35.9	18 - 17	198.272	198.259	0.0124	LabD
10	vent	35.9	18 - 17	188.335	188.327	0.0082	LabD
1	novent	36.9 - 37.3	11 - 17.8	193.186	193.171	0.0160	LabE

sampno	lidtype	temp	rh	w1	w2	ml	lab
2	novent	36.8 37	9 13.5	191.758	191.741	0.0170	LabE
3	novent	36.9 - 37.3	11 - 17.8	191.875	191.853	0.0221	LabE
4	novent	36.9 - 37.3	11 - 17.8	192.378	192.371	0.0064	LabE
5	novent	36.9 - 37.3	11 - 17.8	194.520	194.505	0.0152	LabE
6	novent	36.9 - 37.3	12 18	191.840	191.823	0.0165	LabE
7	novent	36.8 37	9 13.5	194.873	194.862	0.0113	LabE
8	novent	36.9 - 37.3	12 18	193.780	193.763	0.0173	LabE
9	novent	36.9 - 37.3	12 18	192.011	192.005	0.0056	LabE
10	novent	36.9 - 37.3	12 18	191.975	191.964	0.0109	LabE
1	vent	36.7 - 36.8	13.3 - 17.8	191.731	191.717	0.0139	LabE
2	vent	36.7 - 36.8	13.3 - 17.8	191.547	191.534	0.0130	LabE
3	vent	36.7 - 36.8	13.3 - 17.8	189.114	189.101	0.0132	LabE
4	vent	36.7 - 36.8	13.3 - 17.8	192.306	192.289	0.0169	LabE
5	vent	36.7 - 36.8	13.3 - 17.8	188.477	188.462	0.0151	LabE
6	vent	36.4 - 36.9	11.1 - 17.8	182.951	182.940	0.0115	LabE
7	vent	36.4 - 36.9	11.1 - 17.8	181.795	181.714	0.0803	LabE
8	vent	36.4 - 36.9	11.1 - 17.8	185.324	185.308	0.0157	LabE
9	vent	36.4 - 36.9	11.1 - 17.8	192.547	192.526	0.0203	LabE
10	vent	36.4 - 36.9	11.1 - 17.8	194.231	194.216	0.0156	LabE

Table 1: Raw Data - Interlaboratory study for MVTR - Expt VH1

lidtype	lab	mean	median	min	max	sd
novent	LabA	0.010	0.009	0.006	0.015	0.003
novent	LabB	0.012	0.011	0.009	0.024	0.005
novent	LabD	0.035	0.012	0.006	0.125	0.040
novent	LabE	0.014	0.016	0.006	0.022	0.005
vent	LabA	0.030	0.021	0.008	0.070	0.025
vent	LabB	0.023	0.023	0.017	0.040	0.007
vent	LabD	0.015	0.012	0.008	0.037	0.009
vent	LabE	0.022	0.015	0.012	0.080	0.021

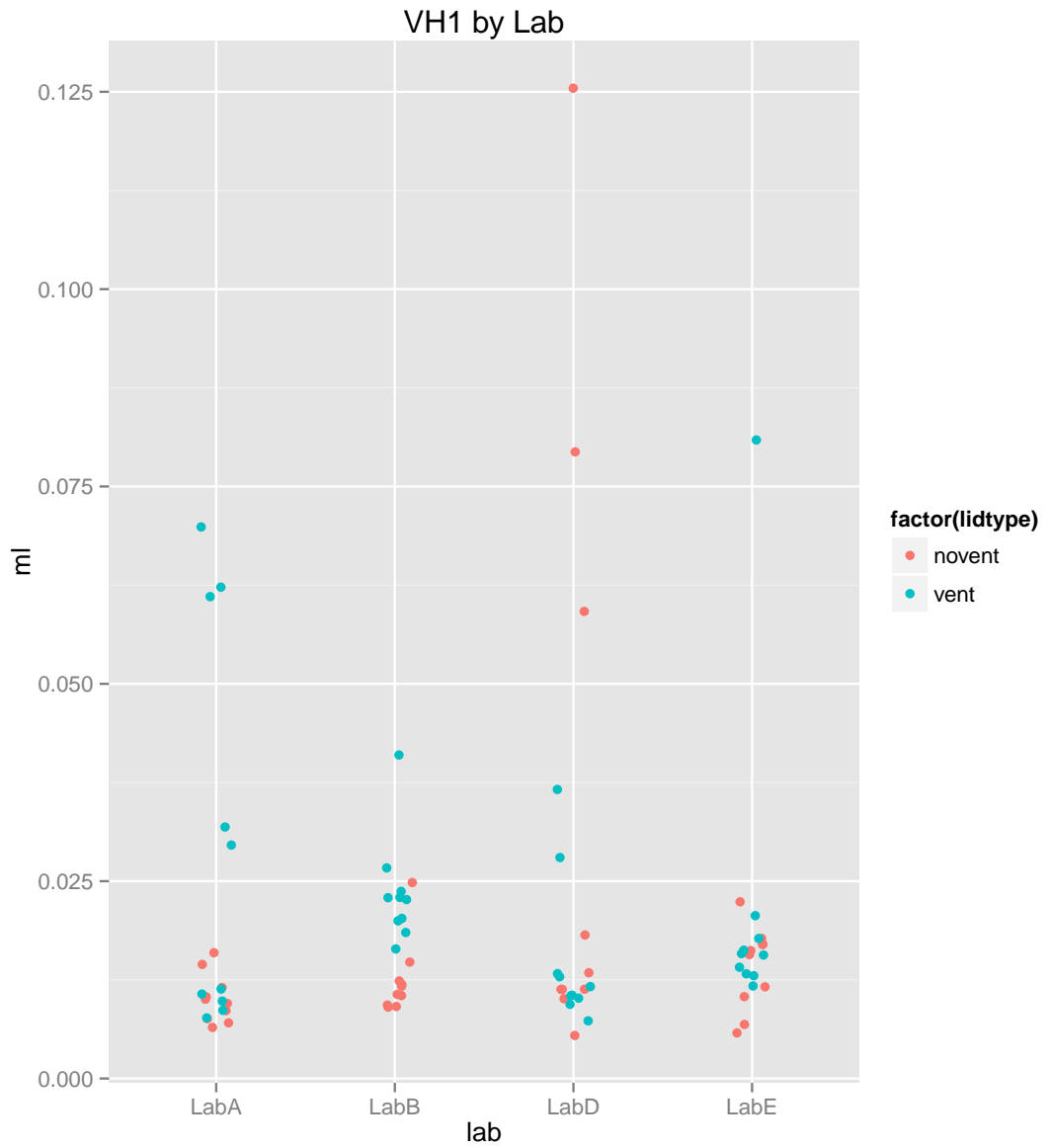
Table 2: Summary Data - Expt VH1

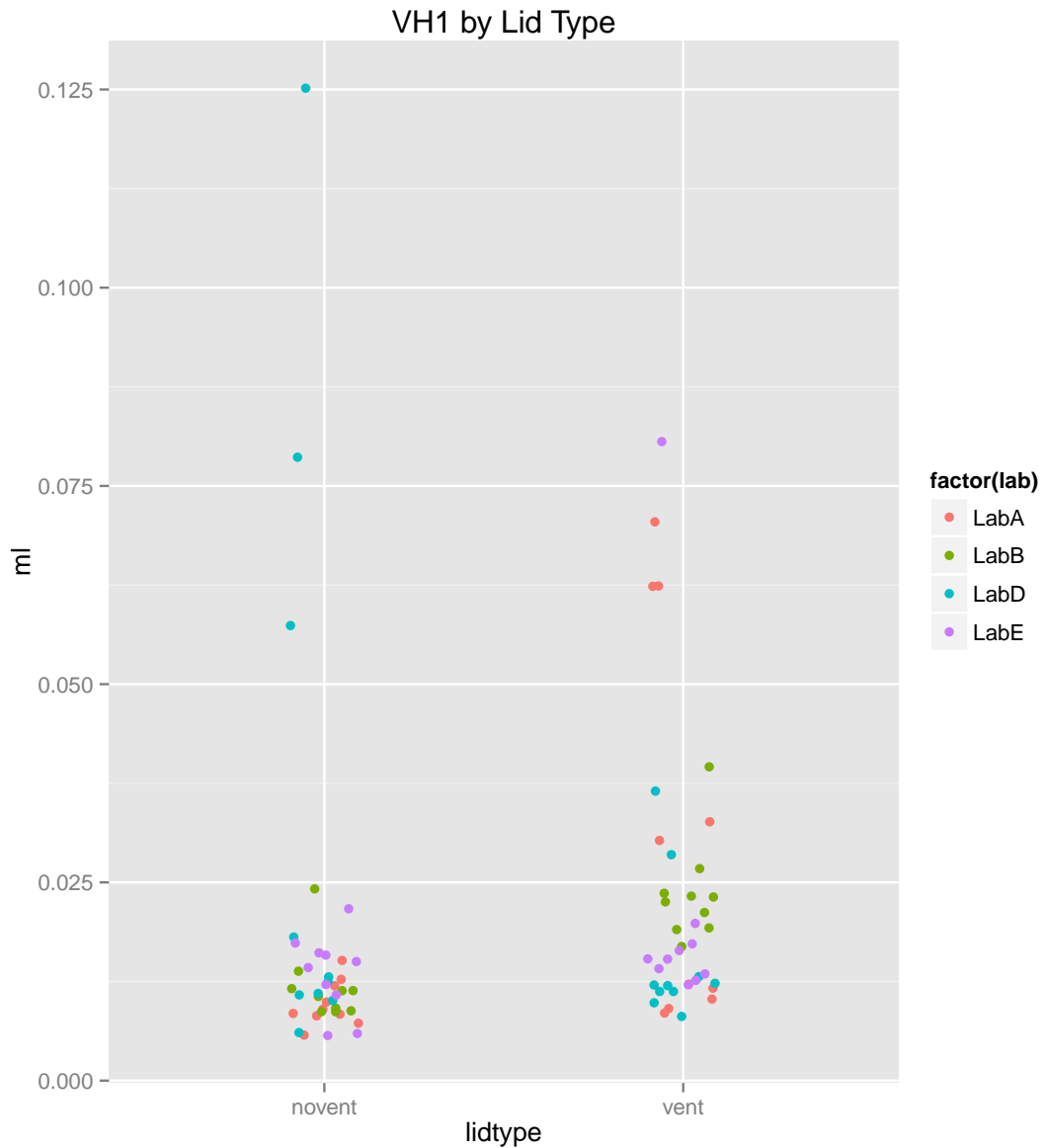
lidtype	mean	median	min	max	sd
novent	0.018	0.011	0.006	0.125	0.022
vent	0.023	0.016	0.008	0.080	0.017

Table 3: Summary Data - Expt VH1

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
lab	3	0.00	0.00	0.65	0.5886
lidtype	1	0.00	0.00	1.42	0.2376
lab:lidtype	3	0.00	0.00	4.10	0.0096
Residuals	72	0.03	0.00		

Table 4: ANOVA for VH1





2.2 VH2

The aim of this experiment was to measure the amount of fluid which is lost from the test cup when a vented lid is used, which is in contact with the fluid.

2.2.1 Experiment Notes

LabD The 24 hour test was not performed because fluid had been shown to breach the vent hole after the initial test (30 mins).

LabE 24 hr Runs abandoned due to the presence of leakage during the 30 minute tests.

sampno	time	temp	rh	w1	w2	ml	lab
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	sampno	time	temp	rh	w1	w2	ml	lab	
	1	1	30m	36.8 to 37.3	9.5 to 12.9	180.919	180.242	0.6769	LabA
	2	2	30m	36.8 to 37.3	9.5 to 12.9	182.568	181.929	0.6387	LabA
	3	3	30m	36.8 to 37.3	9.5 to 12.9	182.957	182.256	0.7018	LabA
	4	4	30m	36.8 to 37.3	9.5 to 12.9	182.920	182.146	0.7736	LabA
	5	5	30m	36.8 to 37.3	9.5 to 12.9	182.671	181.981	0.6904	LabA
	6	6	30m	36.8 to 37.3	9.5 to 12.9	182.952	182.292	0.6603	LabA
	7	7	30m	36.8 to 37.3	9.5 to 12.9	183.226	182.501	0.7251	LabA
	8	8	30m	36.8 to 37.3	9.5 to 12.9	184.108	183.324	0.7843	LabA
	9	9	30m	36.8 to 37.3	9.5 to 12.9	183.745	183.001	0.7438	LabA
	10	10	30m	36.8 to 37.3	9.5 to 12.9	184.579	183.875	0.7034	LabA
	11	1	24h	36.2 to 37.6	9.3 to 14.6	181.154	180.201	0.9535	LabA
	12	2	24h	36.2 to 37.6	9.3 to 14.6	183.269	182.396	0.8734	LabA
	13	3	24h	36.2 to 37.6	9.3 to 14.6	182.423	181.426	0.9975	LabA
	14	4	24h	36.2 to 37.6	9.3 to 14.6	183.101	182.160	0.9411	LabA
	15	5	24h	36.2 to 37.6	9.3 to 14.6	182.695	181.815	0.8800	LabA
	16	6	24h	36.2 to 37.6	9.3 to 14.6	183.025	182.076	0.9487	LabA
	17	7	24h	36.2 to 37.6	9.3 to 14.6	183.670	182.743	0.9268	LabA
	18	8	24h	36.2 to 37.6	9.3 to 14.6	184.617	183.686	0.9303	LabA
	19	9	24h	36.2 to 37.6	9.3 to 14.6	183.604	182.671	0.9329	LabA
	20	10	24h	36.2 to 37.6	9.3 to 14.6	184.336	183.397	0.9397	LabA
	21	1	30m	36.0 - 38.0	2.9 - 5.9	290.357	289.329	1.0281	LabB
	22	2	30m	36.0 - 38.0	2.9 - 5.9	290.675	289.665	1.0098	LabB
	23	3	30m	36.0 - 36.4	3.4 - 6.1	290.382	289.466	0.9150	LabB
	24	4	30m	36.0 - 36.4	3.4 - 6.1	290.855	289.947	0.9084	LabB
	25	5	30m	36.0 - 38.0	3.4 - 5.9	290.338	289.304	1.0346	LabB
	26	6	30m	36.0 - 38.0	3.4 - 5.9	290.749	289.782	0.9677	LabB
	27	7	30m	36.0 - 38.0	2.9 - 5.9	290.460	289.512	0.9484	LabB
	28	8	30m	36.0 - 38.0	2.9 - 5.9	290.708	289.750	0.9575	LabB
	29	9	30m	36.0 - 38.0	2.9 - 5.4	290.373	289.322	1.0513	LabB
	30	10	30m	36.0 - 38.0	2.9 - 5.4	290.737	289.682	1.0550	LabB
	31	1	24h	36.0 - 38.0	2.7 11.7	291.016	289.485	1.5315	LabB
	32	2	24h	36.0 - 38.0	2.7 11.7	289.317	287.735	1.5821	LabB
	33	3	24h	36.0 - 38.0	2.7 11.7	290.717	289.163	1.5537	LabB
	34	4	24h	36.0 - 38.0	2.7 11.7	289.724	288.112	1.6118	LabB
	35	5	24h	36.0 - 38.0	2.7 11.7	290.289	288.662	1.6271	LabB
	36	6	24h	36.0 - 38.0	2.7 11.7	288.823	287.243	1.5792	LabB
	37	7	24h	36.0 - 38.0	2.7 11.7	291.363	289.858	1.5049	LabB
	38	8	24h	36.0 - 38.0	2.7 11.7	290.439	288.875	1.5635	LabB
	39	9	24h	36.0 - 38.0	2.7 11.7	290.265	288.647	1.6184	LabB
	40	10	24h	36.0 - 38.0	2.7 11.7	288.846	287.225	1.6204	LabB
	41	1	30m	36-38	14-21	378.320	377.520	0.8000	LabC
	42	2	30m	36-38	14-21	378.130	377.160	0.9700	LabC
	43	3	30m	36-38	14-21	383.520	382.560	0.9600	LabC
	44	4	30m	36-38	14-21	382.940	382.110	0.8300	LabC
	45	5	30m	36-38	14-21	380.440	379.670	0.7700	LabC
	46	6	30m	36-38	14-21	383.370	382.330	1.0400	LabC
	47	7	30m	36-38	14-21	379.970	379.140	0.8300	LabC
	48	8	30m	36-38	14-21	379.250	378.410	0.8400	LabC
	49	9	30m	36-38	14-21	377.040	375.960	1.0800	LabC
	50	10	30m	36-38	14-21	375.830	374.930	0.9000	LabC
	51	1	24h	NA	NA	NA	NA	NA	LabC
	52	2	24h	NA	NA	NA	NA	NA	LabC
	53	3	24h	NA	NA	NA	NA	NA	LabC

	sampno	time	temp	rh	w1	w2	ml	lab	
	54	4	24h	NA	NA	NA	NA	LabC	
	55	5	24h	NA	NA	NA	NA	LabC	
	56	6	24h	NA	NA	NA	NA	LabC	
	57	7	24h	NA	NA	NA	NA	LabC	
	58	8	24h	NA	NA	NA	NA	LabC	
	59	9	24h	NA	NA	NA	NA	LabC	
	60	10	24h	NA	NA	NA	NA	LabC	
	61	1	30m	36.0 - 35.3	17 - 18	197.610	196.764	0.8462	LabD
	62	2	30m	36.0 - 35.3	17 - 18	193.396	192.537	0.8593	LabD
	63	3	30m	36.0 - 35.3	17 - 18	192.428	191.592	0.8359	LabD
	64	4	30m	36.0 - 35.3	17 - 18	189.464	188.643	0.8215	LabD
	65	5	30m	36.0 - 35.3	17 - 18	189.476	188.632	0.8443	LabD
	66	6	30m	36.0 - 35.3	17 - 18	193.397	192.559	0.8375	LabD
	67	7	30m	36.0 - 35.3	17 - 18	198.239	197.411	0.8281	LabD
	68	8	30m	36.0 - 35.3	17 - 18	197.531	196.760	0.7709	LabD
	69	9	30m	36.0 - 35.3	17 - 18	198.282	197.468	0.8147	LabD
	70	10	30m	36.0 - 35.3	17 - 18	188.373	187.577	0.7962	LabD
	71	1	24h	*	*	NA	NA	NA	LabD
	72	2	24h	*	*	NA	NA	NA	LabD
	73	3	24h	*	*	NA	NA	NA	LabD
	74	4	24h	*	*	NA	NA	NA	LabD
	75	5	24h	*	*	NA	NA	NA	LabD
	76	6	24h	*	*	NA	NA	NA	LabD
	77	7	24h	*	*	NA	NA	NA	LabD
	78	8	24h	*	*	NA	NA	NA	LabD
	79	9	24h	*	*	NA	NA	NA	LabD
	80	10	24h	*	*	NA	NA	NA	LabD
	81	1	30m	36.8 - 36.6	13.5 - 23.5	196.852	195.657	1.1943	LabE
	82	2	30m	36.8 - 36.6	13.5 - 23.5	196.697	195.898	0.7984	LabE
	83	3	30m	36.8 - 36.6	13.5 - 23.5	198.007	196.860	1.1474	LabE
	84	4	30m	36.8 - 36.6	13.5 - 23.5	196.785	195.557	1.2273	LabE
	85	5	30m	36.8 - 36.6	13.5 - 23.5	196.546	195.263	1.2827	LabE
	86	6	30m	36.8 - 36.6	13.5 - 23.5	194.289	193.517	0.7719	LabE
	87	7	30m	36.8 - 36.6	13.5 - 23.5	194.023	193.193	0.8298	LabE
	88	8	30m	36.8 - 36.6	13.5 - 23.5	194.137	193.245	0.8917	LabE
	89	9	30m	36.8 - 36.6	13.5 - 23.5	192.855	191.931	0.9234	LabE
	90	10	30m	36.8 - 36.6	13.5 - 23.5	195.369	194.433	0.9358	LabE
	91	1	24h	NA	NA	NA	NA	NA	LabE
	92	2	24h	NA	NA	NA	NA	NA	LabE
	93	3	24h	NA	NA	NA	NA	NA	LabE
	94	4	24h	NA	NA	NA	NA	NA	LabE
	95	5	24h	NA	NA	NA	NA	NA	LabE
	96	6	24h	NA	NA	NA	NA	NA	LabE
	97	7	24h	NA	NA	NA	NA	NA	LabE
	98	8	24h	NA	NA	NA	NA	NA	LabE
	99	9	24h	NA	NA	NA	NA	NA	LabE
	100	10	24h	NA	NA	NA	NA	NA	LabE

Table 5: Raw Data - Interlaboratory study for MVTR - Expt VH2

time	lab	mean	median	min	max	sd
24h	LabA	0.932	0.936	0.873	0.998	0.035

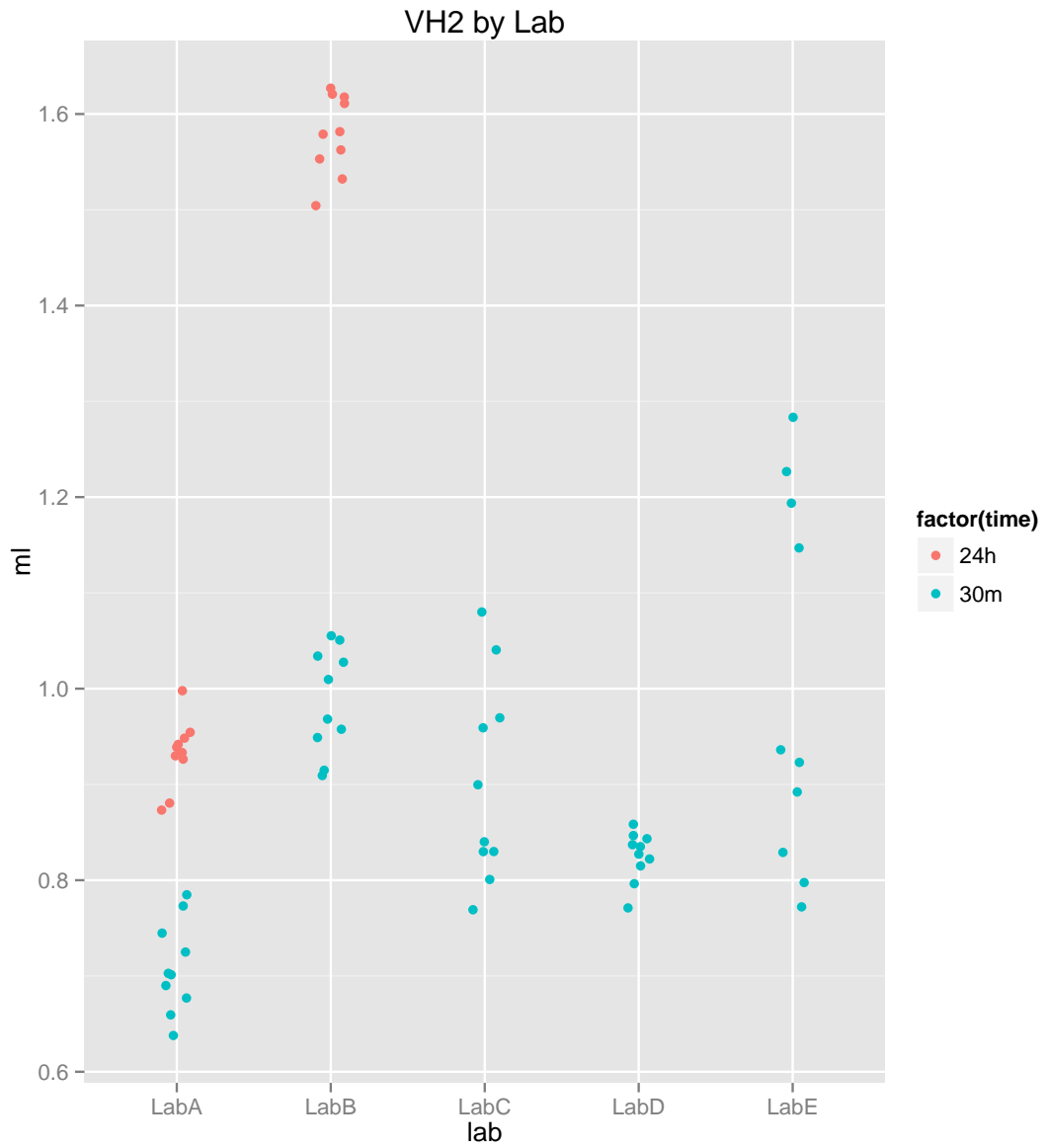
time	lab	mean	median	min	max	sd
24h	LabB	1.579	1.581	1.505	1.627	0.041
24h	LabC	NA	NA	Inf	-Inf	NA
24h	LabD	NA	NA	Inf	-Inf	NA
24h	LabE	NA	NA	Inf	-Inf	NA
30m	LabA	0.710	0.703	0.639	0.784	0.047
30m	LabB	0.988	0.989	0.908	1.055	0.055
30m	LabC	0.902	0.870	0.770	1.080	0.106
30m	LabD	0.825	0.832	0.771	0.859	0.026
30m	LabE	1.000	0.930	0.772	1.283	0.193

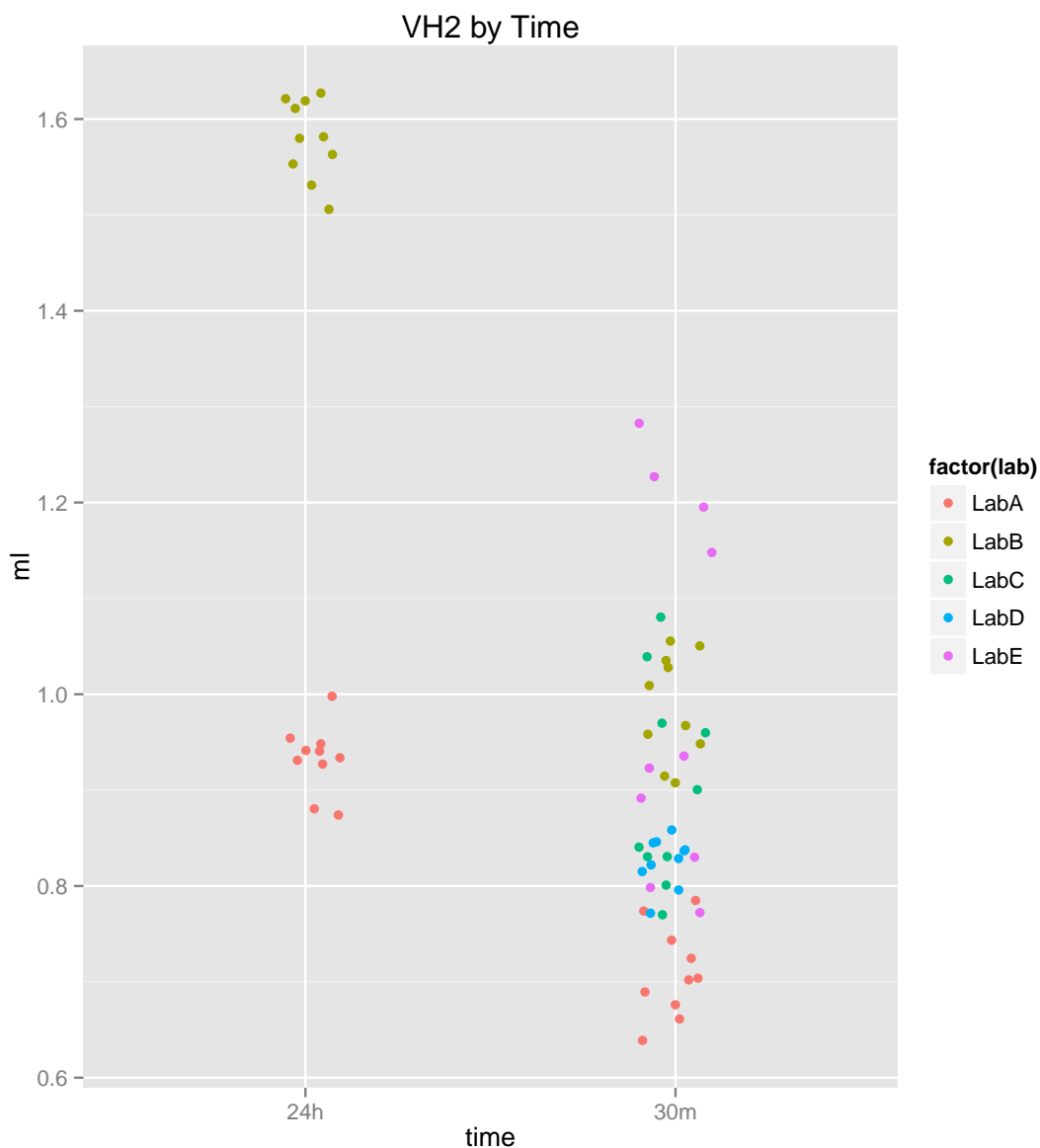
Table 6: Summary Data - Expt VH2

time	mean	median	min	max	sd
24h	1.256	1.251	0.873	1.627	0.334
30m	0.885	0.842	0.639	1.283	0.148

Table 7: Summary Data - Expt VH2

DRAFT





2.3 VH3

To assess the effect that the vent-hole has on doming of dressings which have a high MVTR when tested in contact with the fluid.

2.3.1 Experiment Notes

LabA Run 8 vented lids - Sample leaked - no water left in cup after 24 hours. Data removed.

LabC Run 10, vented - cup dropped, so missing data.

	sampno	lidtype	temp	rh	w1	w2	ml	doming	lab
	1	1 novent	37.0 to 37.8	16 to 85	178.247	165.509	12.7379	Yes	LabA
	2	2 novent	37.0 to 37.8	16 to 85	177.740	167.340	10.4001	Yes	LabA
	3	3 novent	37.0 to 37.8	16 to 85	178.664	167.821	10.8434	Yes	LabA

	sampno	lidtype	temp	rh	w1	w2	ml	doming	lab
	4	4 novent	37.0 to 37.8	16 to 85	177.314	165.655	11.6593	Yes	LabA
	5	5 novent	37.0 to 37.8	16 to 85	178.292	163.273	15.0195	Yes	LabA
	6	6 novent	37.0 to 37.8	16 to 85	178.303	162.501	15.8015	Yes	LabA
	7	7 novent	37.0 to 37.8	16 to 85	178.737	164.586	14.1513	Yes	LabA
	8	8 novent	37.0 to 37.8	16 to 85	178.954	165.956	12.9985	Yes	LabA
	9	9 novent	37.0 to 37.8	16 to 85	178.073	164.956	13.1172	Yes	LabA
	10	10 novent	37.0 to 37.8	16 to 85	178.295	166.071	12.2234	Yes	LabA
	11	1 vent	37.0 to 37.8	16 to 85	177.532	166.872	10.6596	No	LabA
	12	2 vent	37.0 to 37.8	16 to 85	177.908	166.153	11.7548	No	LabA
	13	3 vent	37.0 to 37.8	16 to 85	177.680	170.070	7.6092	No	LabA
	14	4 vent	37.0 to 37.8	16 to 85	176.732	168.830	7.9020	No	LabA
	15	5 vent	37.0 to 37.8	16 to 85	176.394	167.200	9.1935	No	LabA
	16	6 vent	37.0 to 37.8	16 to 85	176.318	166.986	9.3319	No	LabA
	17	7 vent	37.0 to 37.8	16 to 85	178.252	168.529	9.7230	No	LabA
	19	9 vent	37.0 to 37.8	16 to 85	177.611	168.133	9.4781	No	LabA
	20	10 vent	37.0 to 37.8	16 to 85	179.240	169.177	10.0635	No	LabA
201	1 novent	36.0 - 38.0	2.9 - 7.6	275.781	266.467	9.3139	Yes	LabB	
21	2 novent	36.0 - 38.0	2.9 - 7.6	277.408	266.253	11.1550	Yes	LabB	
22	3 novent	36.0 - 38.0	2.9 - 7.6	277.418	267.242	10.1759	Yes	LabB	
23	4 novent	36.0 - 38.0	2.9 - 7.6	276.230	266.420	9.8102	Yes	LabB	
24	5 novent	36.0 - 38.0	2.9 - 7.6	275.680	266.765	8.9149	Yes	LabB	
25	6 novent	36.0 - 38.0	2.9 - 7.6	276.269	265.915	10.3539	Yes	LabB	
26	7 novent	36.0 - 38.0	2.9 - 7.6	276.930	265.729	11.2009	Yes	LabB	
27	8 novent	36.0 - 38.0	2.9 - 7.6	275.274	265.873	9.4005	Yes	LabB	
28	9 novent	36.0 - 38.0	2.9 - 7.6	276.985	267.337	9.6477	Yes	LabB	
29	10 novent	36.0 - 38.0	2.9 - 7.6	276.299	265.472	10.8271	Yes	LabB	
30	1 vent	36.0 - 37.4	2.9 - 6.4	278.058	268.349	9.7095	No	LabB	
31	2 vent	36.0 - 37.4	2.9 - 6.4	278.147	268.541	9.6066	No	LabB	
32	3 vent	36.0 - 37.4	2.9 - 6.4	276.537	268.685	7.8519	No	LabB	
33	4 vent	36.0 - 37.4	2.9 - 6.4	278.131	269.498	8.6332	No	LabB	
34	5 vent	36.0 - 37.4	2.9 - 6.4	276.455	268.258	8.1963	No	LabB	
35	6 vent	36.0 - 37.4	2.9 - 6.4	276.270	267.223	9.0477	No	LabB	
36	7 vent	36.0 - 37.4	2.9 - 6.4	271.373	262.633	8.7398	No	LabB	
37	8 vent	36.0 - 37.4	2.9 - 6.4	277.988	269.601	8.3872	No	LabB	
38	9 vent	36.0 - 37.4	2.9 - 6.4	276.654	267.401	9.2532	No	LabB	
39	10 vent	36.0 - 37.4	2.9 - 6.4	277.818	268.502	9.3155	No	LabB	
40	1 novent	36-38	22-36	398.630	388.840	9.7900	YES	LabC	
41	2 novent	36-38	22-36	395.540	382.800	12.7400	YES	LabC	
42	3 novent	36-38	22-36	399.310	386.980	12.3300	YES	LabC	
43	4 novent	36-38	22-36	396.890	384.030	12.8600	YES	LabC	
44	5 novent	36-38	22-36	402.550	388.920	13.6300	YES	LabC	
45	6 novent	36-38	22-36	395.640	379.160	16.4800	YES	LabC	
46	7 novent	36-38	22-36	393.130	383.590	9.5400	YES	LabC	
47	8 novent	36-38	22-36	400.780	390.150	10.6300	YES	LabC	
48	9 novent	36-38	22-36	393.700	383.420	10.2800	YES	LabC	
49	10 novent	36-38	22-36	395.140	380.770	14.3700	YES	LabC	
50	1 vent	36-38	22-36	353.350	343.230	10.1200	NO	LabC	
51	2 vent	36-38	22-36	355.190	344.310	10.8800	NO	LabC	
52	3 vent	36-38	22-36	359.560	348.060	11.5000	NO	LabC	
53	4 vent	36-38	22-36	357.290	347.730	9.5600	NO	LabC	
54	5 vent	36-38	22-36	355.540	345.250	10.2900	NO	LabC	
55	6 vent	36-38	22-36	353.040	344.020	9.0200	NO	LabC	
56	7 vent	36-38	22-36	360.850	350.340	10.5100	NO	LabC	

	sampno	lidtype	temp	rh	w1	w2	ml	doming	lab
	57	8 vent	36-38	22-36	355.890	345.190	10.7000	NO	LabC
	58	9 vent	36-38	22-36	351.160	341.450	9.7100	NO	LabC
	59	10 vent	36-38	22-36	353.270	NA	NA	NA	LabC
	60	1 novent	35.8 - 36.0	18	186.710	176.481	10.2293	Yes	LabD
	61	2 novent	35.8 - 36.0	18	182.090	171.898	10.1927	Yes	LabD
	62	3 novent	35.8 - 36.0	18	186.785	176.777	10.0085	Yes	LabD
	63	4 novent	35.8 - 36.0	18	181.876	172.798	9.0783	Yes	LabD
	64	5 novent	35.8 - 36.0	18	178.457	167.690	10.7665	Yes	LabD
	65	6 novent	35.8 - 36.0	18	184.463	173.387	11.0753	Yes	LabD
	66	7 novent	35.8 - 36.0	18	176.480	164.890	11.5894	Yes	LabD
	67	8 novent	35.8 - 36.0	18	181.782	171.163	10.6192	Yes	LabD
	68	9 novent	35.8 - 36.0	18	183.042	171.216	11.8260	Yes	LabD
	69	10 novent	35.8 - 36.0	18	171.037	160.095	10.9421	Yes	LabD
	70	1 vent	36.6 - 36.5	17 - 18	184.751	175.863	8.8887	No	LabD
	71	2 vent	36.6 - 36.5	17 - 18	190.519	181.531	8.9878	No	LabD
	72	3 vent	36.6 - 36.5	17 - 18	182.033	172.728	9.3048	No	LabD
	73	4 vent	36.6 - 36.5	17 - 18	183.015	173.521	9.4948	No	LabD
	74	5 vent	36.6 - 36.5	17 - 18	189.594	181.893	7.7013	No	LabD
	75	6 vent	36.6 - 36.5	17 - 18	191.115	181.711	9.4043	No	LabD
	76	7 vent	36.6 - 36.5	17 - 18	182.815	172.984	9.8314	No	LabD
	77	8 vent	36.6 - 36.5	17 - 18	185.056	174.207	10.8491	No	LabD
	78	9 vent	36.6 - 36.5	17 - 18	191.893	181.044	10.8488	No	LabD
	79	10 vent	36.6 - 36.5	17 - 18	182.275	171.287	10.9876	No	LabD
	80	1 novent	37.0 - 37.1	14 - 17	190.006	177.807	12.1997	Yes In	LabE
	81	2 novent	37.0 - 37.1	14 - 17	190.262	177.206	13.0569	Yes In	LabE
	82	3 novent	37.0 - 37.1	14 - 17	189.312	179.730	9.5825	No	LabE
	83	4 novent	37.0 - 37.1	14 - 17	190.826	180.059	10.7678	Yes In	LabE
	84	5 novent	37.0 - 37.1	14 - 17	190.396	178.116	12.2803	Yes In	LabE
	85	6 novent	37.2 - 37.5	8 16	189.598	178.144	11.4540	Yes In	LabE
	86	7 novent	37.2 - 37.5	8 16	189.554	177.944	11.6098	Yes In	LabE
	87	8 novent	37.2 - 37.5	8 16	190.996	174.920	16.0756	No	LabE
	88	9 novent	37.2 - 37.5	8 16	189.580	177.156	12.4246	Yes In	LabE
	89	10 novent	37.2 - 37.5	8 16	188.970	177.749	11.2209	Yes In	LabE
	90	1 vent	36.4 - 37.2	12 - 18.3	185.615	175.487	10.1284	No	LabE
	91	2 vent	36.4 - 37.2	12 - 18.3	184.010	173.700	10.3103	No	LabE
	92	3 vent	36.4 - 37.2	12 - 18.3	181.494	170.679	10.8149	No	LabE
	93	4 vent	36.4 - 37.2	12 - 18.3	186.152	175.397	10.7555	No	LabE
	94	5 vent	36.4 - 37.2	12 - 18.3	191.275	180.314	10.9610	No	LabE
	95	6 vent	36.6 - 37.4	11.5 - 17.5	180.834	170.246	10.5882	No	LabE
	96	7 vent	36.6 - 37.4	11.5 - 17.5	174.648	165.154	9.4939	No	LabE
	97	8 vent	36.6 - 37.4	11.5 - 17.5	182.243	172.173	10.0694	No	LabE
	98	9 vent	36.6 - 37.4	11.5 - 17.5	179.668	169.053	10.6151	No	LabE
	99	10 vent	36.6 - 37.4	11.5 - 17.5	179.968	170.351	9.6168	No	LabE

Table 8: Raw Data - Interlaboratory study for MVTR - Expt VH3

lidtype	lab	mean	median	min	max	sd
novent	LabA	12.895	12.868	10.400	15.802	1.733
novent	LabB	10.080	9.993	8.915	11.201	0.797
novent	LabC	12.265	12.535	9.540	16.480	2.231
novent	LabD	10.633	10.693	9.078	11.826	0.804
novent	LabE	12.067	11.905	9.582	16.076	1.713
vent	LabA	9.524	9.478	7.609	11.755	1.277
vent	LabB	8.874	8.894	7.852	9.709	0.616
vent	LabC	10.254	10.290	9.020	11.500	0.752
vent	LabD	9.630	9.450	7.701	10.988	1.039
vent	LabE	10.335	10.449	9.494	10.961	0.503

Table 9: Summary Data - Expt VH3

lidtype	mean	median	min	max	sd
novent	11.588	11.178	8.915	16.480	1.838
vent	9.717	9.663	7.609	11.755	0.999

Table 10: Summary Data - Expt VH3

Labs	Lid Type	Doming
LabA	novent	10/10
LabB	novent	10/10
LabC	novent	10/10
LabD	novent	10/10
LabE	novent	8/10
LabA	vent	0/9
LabB	vent	0/10
LabC	vent	0/9
LabD	vent	0/10
LabE	vent	0/10

Table 11: VH3 - doming by lab/lid

lidtype	doming
novent	48/50
vent	0/48

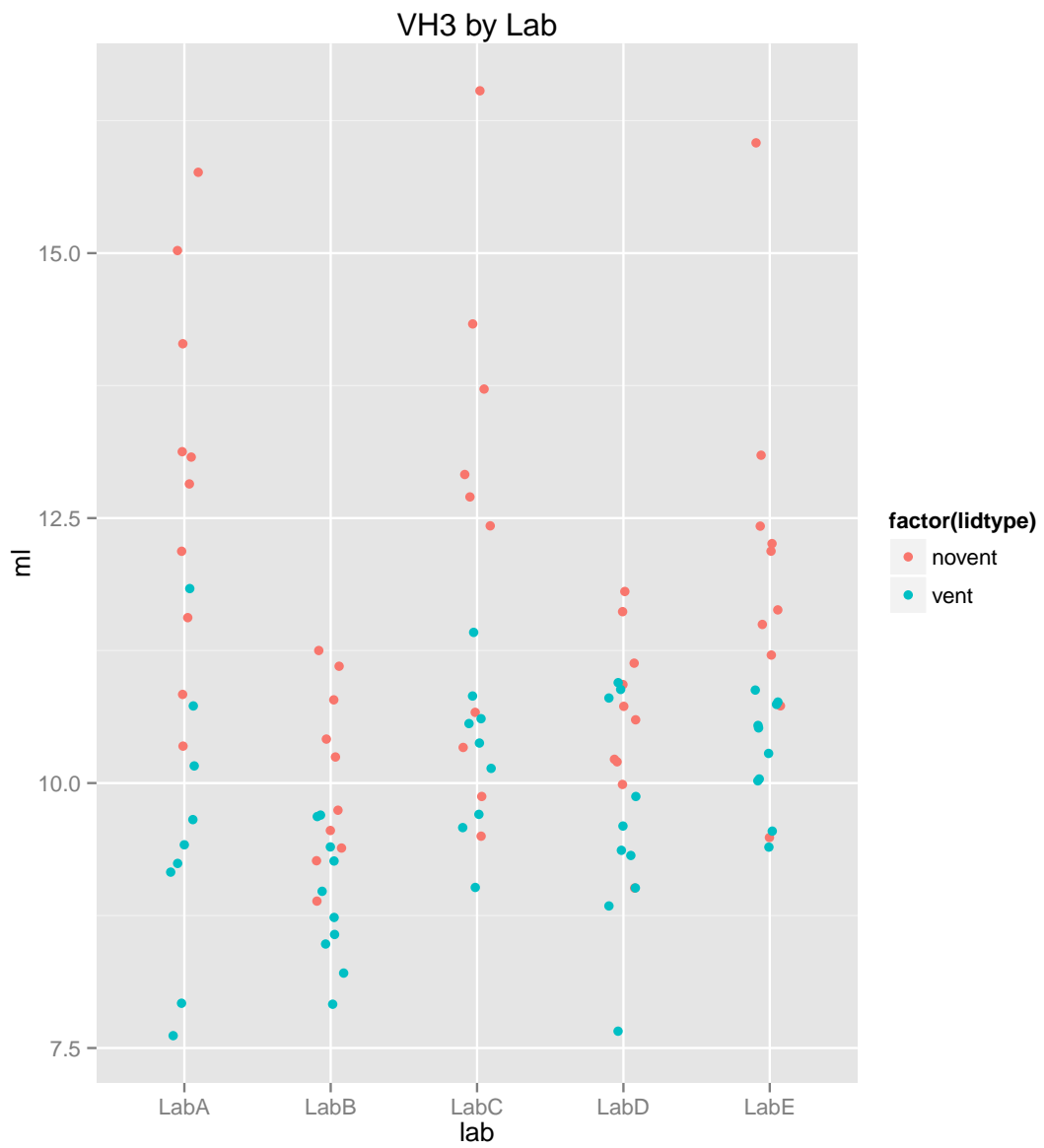
Table 12: VH3 - doming by lid

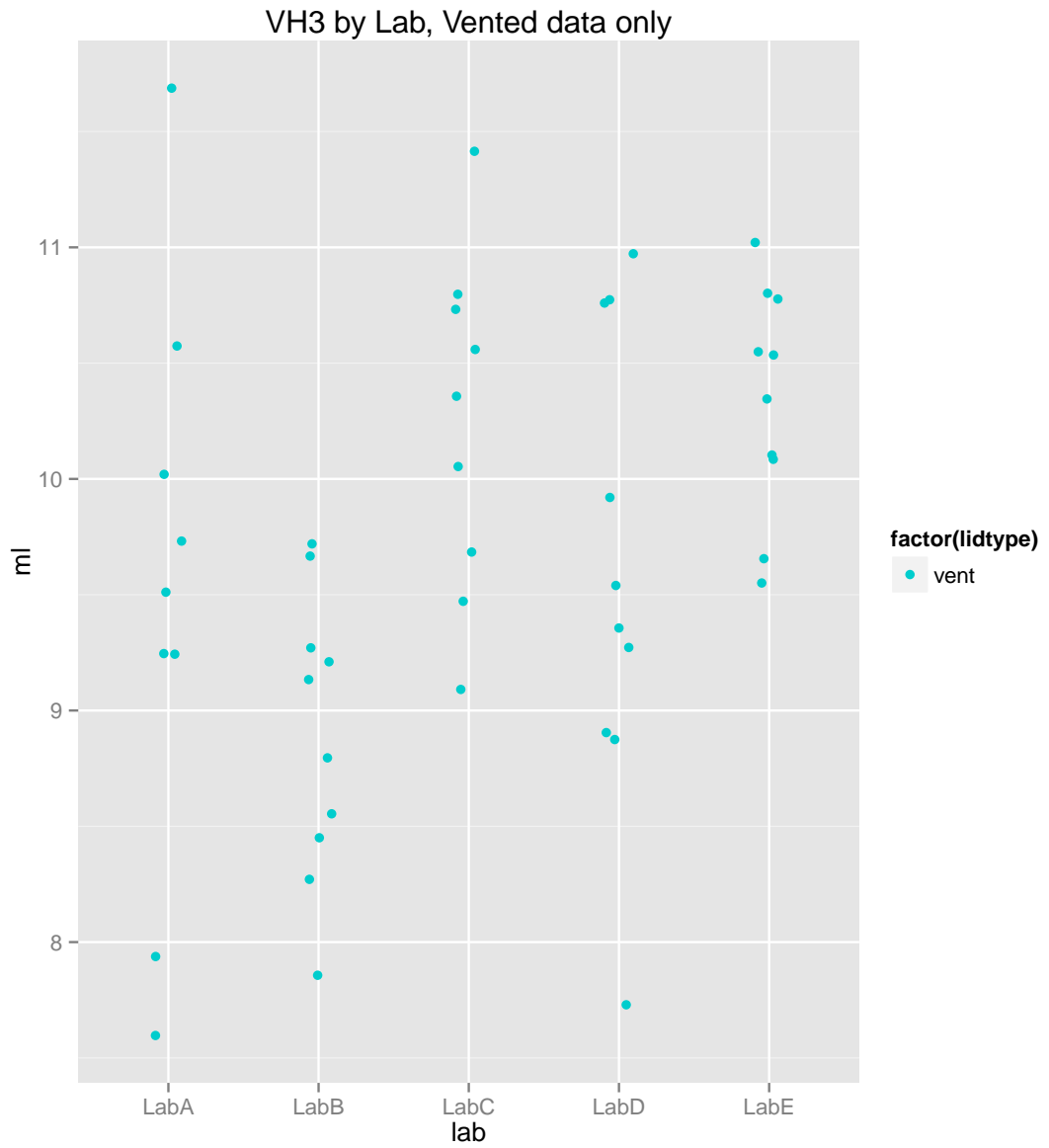
	Df	Sum Sq	Mean Sq	F value	Pr(>F)
lab	4	55.26	13.81	8.52	0.0000
lidtype	1	83.46	83.46	51.45	0.0000
lab:lidtype	4	16.82	4.20	2.59	0.0420
Residuals	88	142.76	1.62		

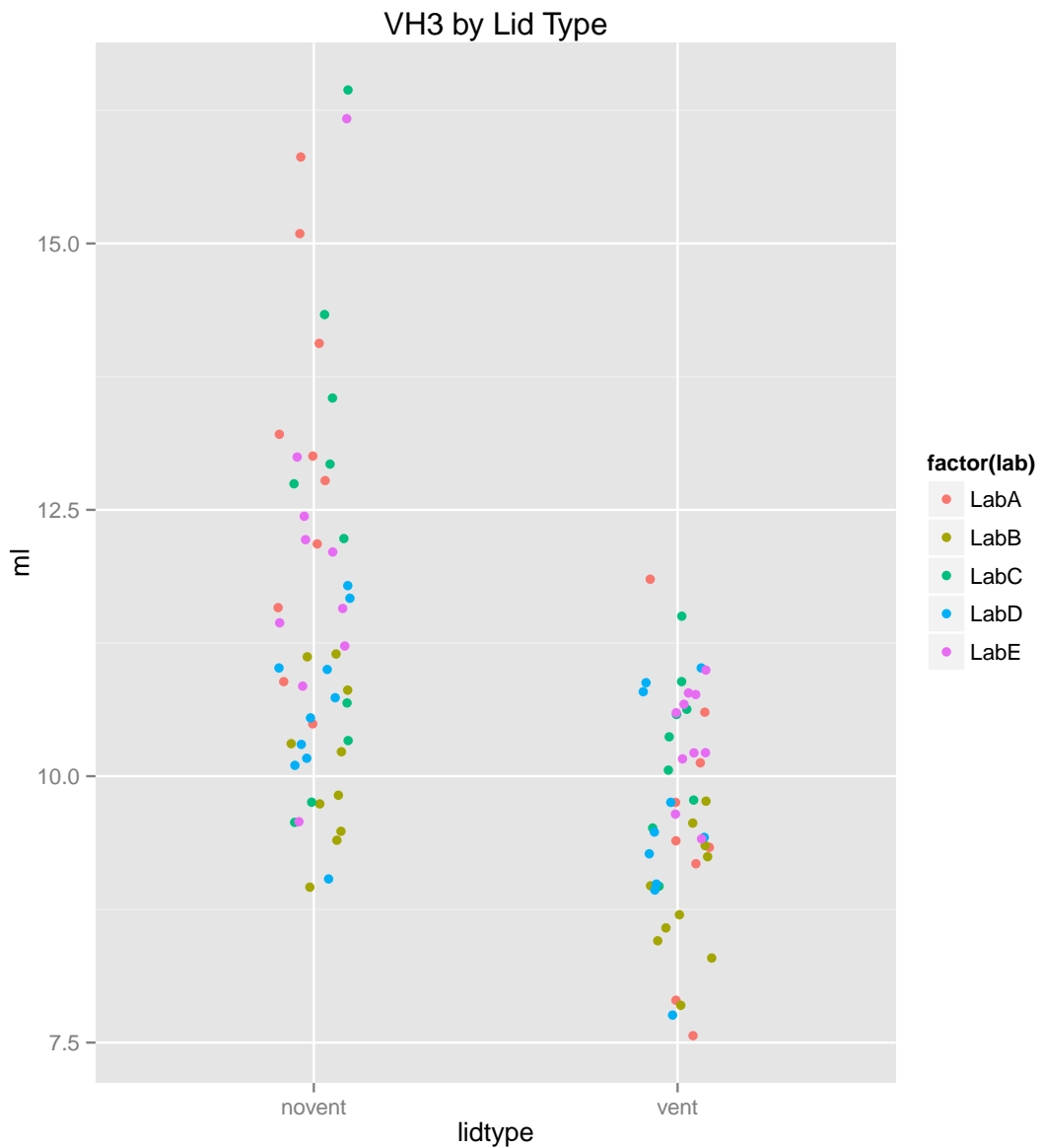
Table 13: ANOVA for VH3

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
lab	4	13.94	3.48	4.54	0.0038
Residuals	43	32.98	0.77		

Table 14: ANOVA for VH3, Vented data only







```
##
## Welch Two Sample t-test
##
## data: ml[lidtype == "vent"] and ml[lidtype == "novent"]
## t = -6.294, df = 76.27, p-value = 1.794e-08
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
## -2.464 -1.279
## sample estimates:
## mean of x mean of y
## 9.717 11.588
```


2.4 DW1

To measure the effect that wetting the dressing has on the MVTR when the dressing is not in contact with the fluid, and assess whether a larger air gap is necessary.

2.4.1 Experiment Notes

LabA Ran out of time to complete the experiments.

LabE Run 7 (noshake) data removed due to backing paper being left on during test.

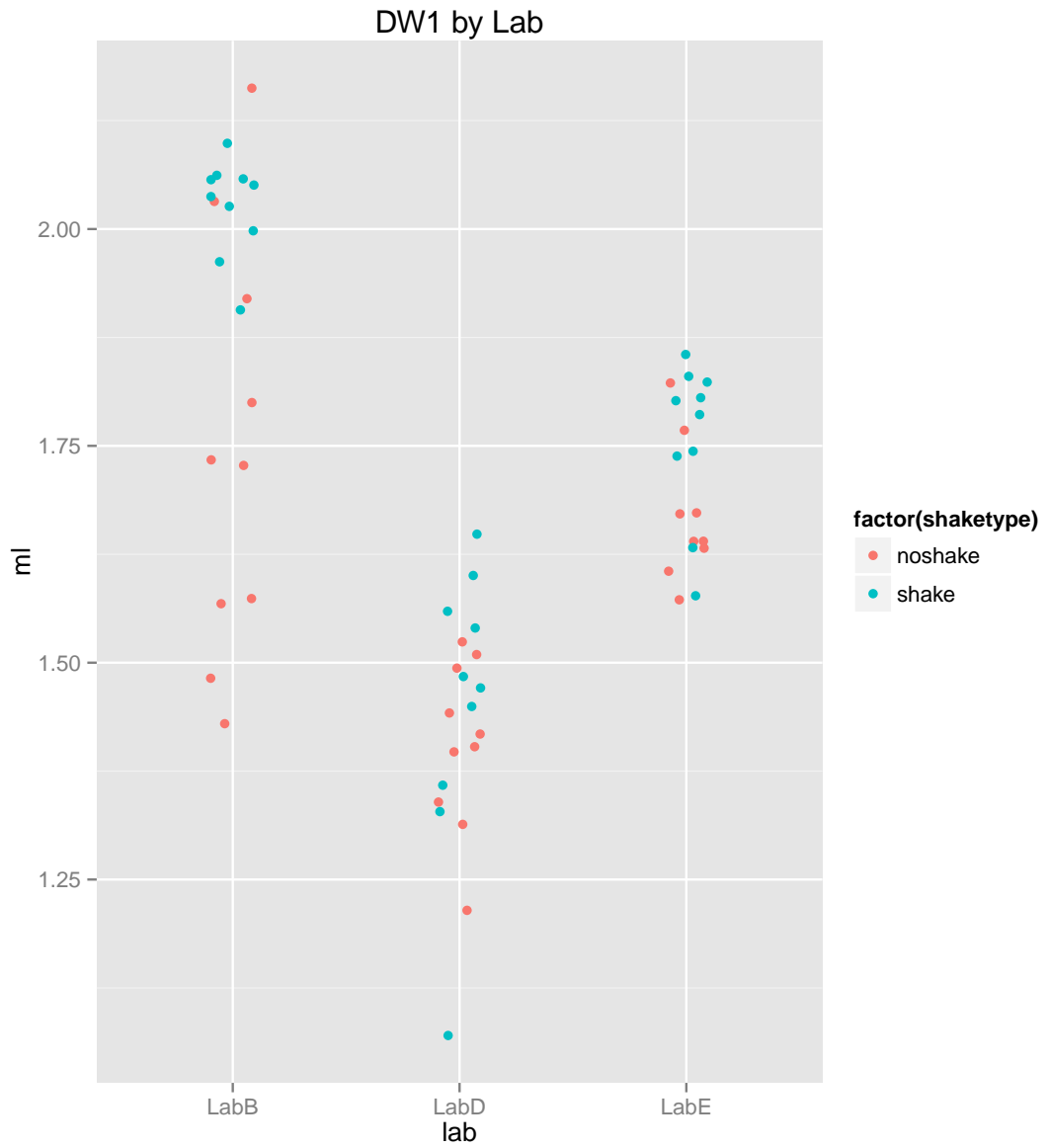
LabC Humidity was not in control during the test period, so it was not thought useful to complete the DW1 experiments.

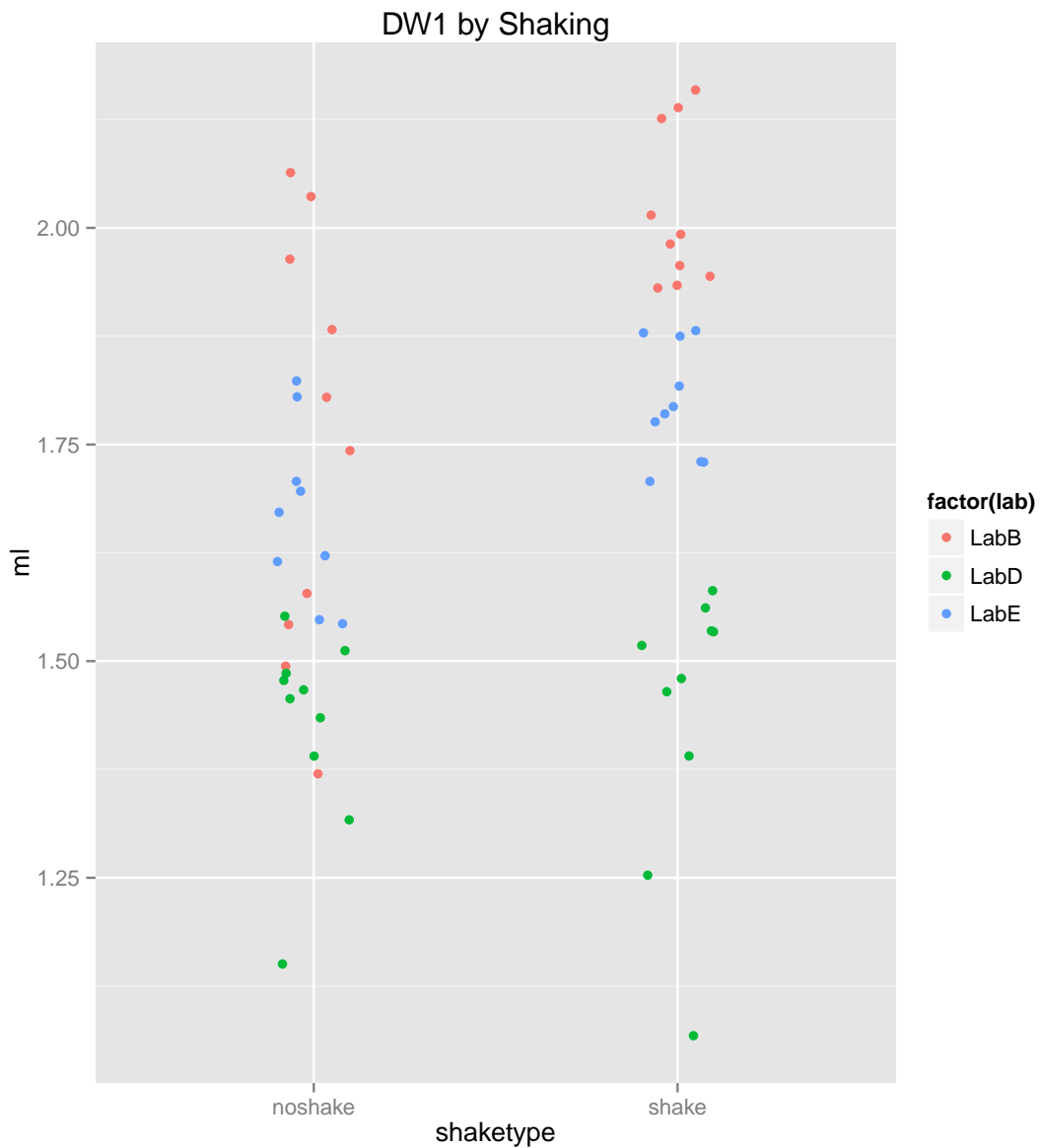
	sampno	shaketype	temp	rh	w1	w2	ml	doming	airgap	lab	
	1	1	noshake	36.0 - 38.0	2.6 - 7.6	268.525	266.993	1.5324	No	21mm	LabB
	2	2	noshake	36.0 - 38.0	2.6 - 7.6	267.439	265.446	1.9931	No	21mm	LabB
	3	3	noshake	36.0 - 38.0	2.6 - 7.6	266.262	264.186	2.0763	No	21mm	LabB
	4	4	noshake	36.0 - 38.0	2.6 - 7.6	268.575	267.033	1.5419	No	21mm	LabB
	5	5	noshake	36.0 - 38.0	2.6 - 7.6	266.525	264.723	1.8029	No	21mm	LabB
	6	6	noshake	36.0 - 38.0	2.6 - 7.6	266.788	265.435	1.3529	No	21mm	LabB
	7	7	noshake	36.0 - 38.0	2.6 - 7.6	266.610	264.866	1.7442	No	21mm	LabB
	8	8	noshake	36.0 - 38.0	2.6 - 7.6	266.202	264.405	1.7976	No	21mm	LabB
	9	9	noshake	36.0 - 38.0	2.6 - 7.6	267.022	265.450	1.5729	No	21mm	LabB
	10	10	noshake	36.0 - 38.0	2.6 - 7.6	267.632	265.636	1.9956	No	21mm	LabB
	11	1	shake	36.0 - 38.0	2.7 -11.7	266.217	264.109	2.1077	No	21mm	LabB
	12	2	shake	36.0 - 38.0	2.7 -11.7	268.200	266.267	1.9329	No	21mm	LabB
	13	3	shake	36.0 - 38.0	2.7 -11.7	266.062	263.933	2.1285	No	21mm	LabB
	14	4	shake	36.0 - 38.0	2.7 -11.7	266.406	264.304	2.1022	No	21mm	LabB
	15	5	shake	36.0 - 38.0	2.7 -11.7	267.470	265.518	1.9526	No	21mm	LabB
	16	6	shake	36.0 - 38.0	2.7 -11.7	268.101	266.080	2.0201	No	21mm	LabB
	17	7	shake	36.0 - 38.0	2.7 -11.7	266.478	264.431	2.0479	No	21mm	LabB
	18	8	shake	36.0 - 38.0	2.7 -11.7	268.284	266.300	1.9847	No	21mm	LabB
	19	9	shake	36.0 - 38.0	2.7 -11.7	266.748	264.814	1.9342	No	21mm	LabB
	20	10	shake	36.0 - 38.0	2.7 -11.7	266.606	264.687	1.9189	No	21mm	LabB
	21	1	noshake	35.8 - 36	18	170.762	169.639	1.1238	no	19 19	LabD
	22	2	noshake	35.8 - 36	18	177.998	176.533	1.4650	no	19 20	LabD
	23	3	noshake	35.8 - 36	18	166.033	164.593	1.4393	no	19 20	LabD
	24	4	noshake	35.8 - 36	18	177.935	176.483	1.4518	no	19 20	LabD
	25	5	noshake	35.8 - 36	18	178.695	177.288	1.4069	no	20 21	LabD
	26	6	noshake	35.8 - 36	18	166.142	164.656	1.4855	no	19 19	LabD
	27	7	noshake	35.8 - 36	18	170.713	169.288	1.4244	no	19 19	LabD
	28	8	noshake	35.8 - 36	18	182.774	181.391	1.3835	no	20 20	LabD
	29	9	noshake	35.8 - 36	18	178.054	176.641	1.4132	no	20 20	LabD
	30	10	noshake	35.8 - 36	18	178.556	177.124	1.4316	no	19 20	LabD
	31	1	shake	35.9	18	168.400	166.887	1.5131	no	20 20	LabD
	32	2	shake	35.9	18	174.661	173.222	1.4385	no	20 20	LabD
	33	3	shake	35.9	18	174.760	173.123	1.6373	no	20 21	LabD
	34	4	shake	35.9	18	177.782	176.237	1.5449	no	20 21	LabD
	35	5	shake	35.9	18	173.084	171.737	1.3473	no	20 20	LabD
	36	6	shake	35.9	18	157.986	156.504	1.4816	no	19 20	LabD
	37	7	shake	35.9	18	171.166	169.725	1.4413	no	20 20	LabD
	38	8	shake	35.9	18	180.264	179.135	1.1289	no	20 20	LabD
	39	9	shake	35.9	18	170.913	169.324	1.5890	no	20 21	LabD
	40	10	shake	35.9	18	173.809	172.342	1.4671	no	20 21	LabD

	sampno	shaketype	temp	rh	w1	w2	ml	doming	airgap	lab
110	1	noshake	36.6 - 36.7	10 19	175.250	173.511	1.7390	No	18	LabE
210	2	noshake	36.6 36.7	10 19	175.753	174.073	1.6792	No	18	LabE
310	3	noshake	36.6 36.7	10 19	175.417	173.858	1.5589	No	18	LabE
41	4	noshake	36.6 36.7	10 19	174.112	172.543	1.5690	No	18	LabE
51	5	noshake	36.6 36.7	10 19	174.420	172.830	1.5895	No	18	LabE
61	6	noshake	36.8 - 37.1	12 19	178.164	176.552	1.6121	No	19	LabE
81	8	noshake	36.8 37.1	12 19	174.921	173.295	1.6261	No	19	LabE
91	9	noshake	36.8 37.1	12 19	171.497	169.822	1.6757	No	19	LabE
101	10	noshake	36.8 37.1	12 19	175.574	173.791	1.7831	No	19	LabE
111	1	shake	36.8 - 37.2	11 - 17.5	181.035	179.154	1.8815	NA	18	LabE
121	2	shake	36.8 37.2	11 17.5	179.092	177.334	1.7578	NA	18	LabE
131	3	shake	36.8 37.2	11 - 17.5	177.909	176.076	1.8323	NA	18	LabE
141	4	shake	36.8 37.2	11 - 17.5	181.384	179.709	1.6750	NA	18	LabE
151	5	shake	36.8 37.2	11 - 17.5	166.410	164.593	1.8168	NA	18	LabE
161	6	shake	36.9 - 37.4	9 19	178.614	176.787	1.8278	NA	19	LabE
171	7	shake	36.9 37.4	9 19	179.580	177.855	1.7252	NA	19	LabE
181	8	shake	36.9 37.4	9 19	176.074	174.386	1.6886	NA	19	LabE
191	9	shake	36.9 37.4	9 19	181.076	179.312	1.7644	NA	19	LabE
201	10	shake	36.9 37.4	9 19	179.001	177.188	1.8130	NA	19	LabE

Table 15: Raw Data - Interlaboratory study for MVTR - Expt DW1

DRAFT





```
##  
## Welch Two Sample t-test  
##  
## data: ml[shaketype == "shake"] and ml[shaketype == "noshake"]  
## t = 2.558, df = 56.02, p-value = 0.01325  
## alternative hypothesis: true difference in means is not equal to 0  
## 95 percent confidence interval:  
## 0.03354 0.27567  
## sample estimates:  
## mean of x mean of y  
## 1.750 1.595
```

3 Discussion

3.1 Methodology Issues

1. LabD used a different batch of product for DW1 than the other labs.
2. Two labs in VH3 had RH values outside of the CEN limits ($\leq 20\%RH$) - LabA and LabC.

3.2 VH1 - Effect of vent holes on blank systems

The vents appear to have no effect on blank systems (i.e., systems without dressings). The variability seen in the 'novent' data is larger than the 'vent' data. An initial visual comparison shows little difference between the two data sets, although there is a noticeable 'clumping' of data close to zero in the novent data.

In addition there are a small number of results with no vent which are higher than the vented results. A possible explanation is that the chamber may become pressurised in the warm incubator, thus challenging the sealed chamber and leaking. This is an artifact of the test undertaken, as under normal product testing the flexibility of the dressing would probably compensate for slight pressure changes.

3.3 VH2 - Effect of vents when fluid is in contact with vent hole

This experiment was designed to check whether a test facility could use the same vented lids for in-contact and not-in-contact experiments. However, all experiments show a significant loss of fluid (between 0.5ml and 1.6 ml) when the fluid is in contact with the vented lid (not-in-contact experiments).

Because doming is not observed when undertaking not-in-contact tests, there is no pressure equalisation issue to be addressed.

It is therefore clear that either non-vented lids or chambers which vent above the fluid level must be used when undertaking fluid not-in-contact experiments (i.e., when the fluid is in contact with the base of the chamber, and the dressing is on top).

3.4 VH3 - Effect of vents on doming of dressing and MVTR results

Nearly all experiments run with the unvented lids showed doming of the dressings, and resulted in higher MVTR values. The differences between the vented and unvented lids is approximately 2ml over 24 hours, meaning that the doming due to unvented lids increases the MVTR value by approximately 20%.

The presence of a vent eliminates any doming, and therefore avoids the artificially high MVTR associated with doming.

In addition the use of a vent reduces the variability of the test results from an SD of 1.8 with no vent to a SD of 1.0 with the vent.

3.5 DW1 - Effect of shaking on MVTR results

This experiment was designed to check whether accidentally splashing the dressing when doing a not-in-contact test affected the MVTR figures.

Whilst the results are statistically significant, the practical effect appears to be marginal.

It is believed that this is particularly a problem with foam and hydrocolloid dressings (as opposed to films) when accidentally splashed during this test. It may therefore be worth considering undertaking a repeat of this test with a different dressing, such as a foam dressing, in the future.

4 Conclusion

1. There is no significant effect on fluid loss due to the vent hole in the 'fluid in contact' orientation.
2. There is a significant effect on fluid loss due to the vent hole in the 'fluid not in contact' orientation, when fluid is directly in contact with the hole. Therefore either blank lids should be used for these experiments, or vent holes must not be in contact with the test fluid.
3. The use of a vent hole eliminates doming and reduces the artificially high MVTR seen with high performing MVTR dressings when no vent hole is present. It also almost halves the experimental variability significantly (from SD=1.8 to SD=1).
4. It is the recommendation of the group that the European Standard is amended to include the use of a vented chamber for MVTR experiments where the fluid is in contact with the dressing.

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