LIGO E-Document Number: **E1000453-v1**

Sample Test:

Material under test:			**EP30-2 Bonded Quartz Glass Disks**		
units			5.07E+01	cm^2 bond surface	
absorption	0.886129	±	0.170884127	ppm/yr	1 sigma
scatter	20.11882	±	2.852514566	ppm/yr	1 sigma
max. normalized absorption			2.42E-02	ppm/yr/unit	2 sigma
max. normalized scatter			5.10E-01	ppm/yr/unit	2 sigma
test turbopump speed (liter/s)			24.39157403	torr/liter/sec	

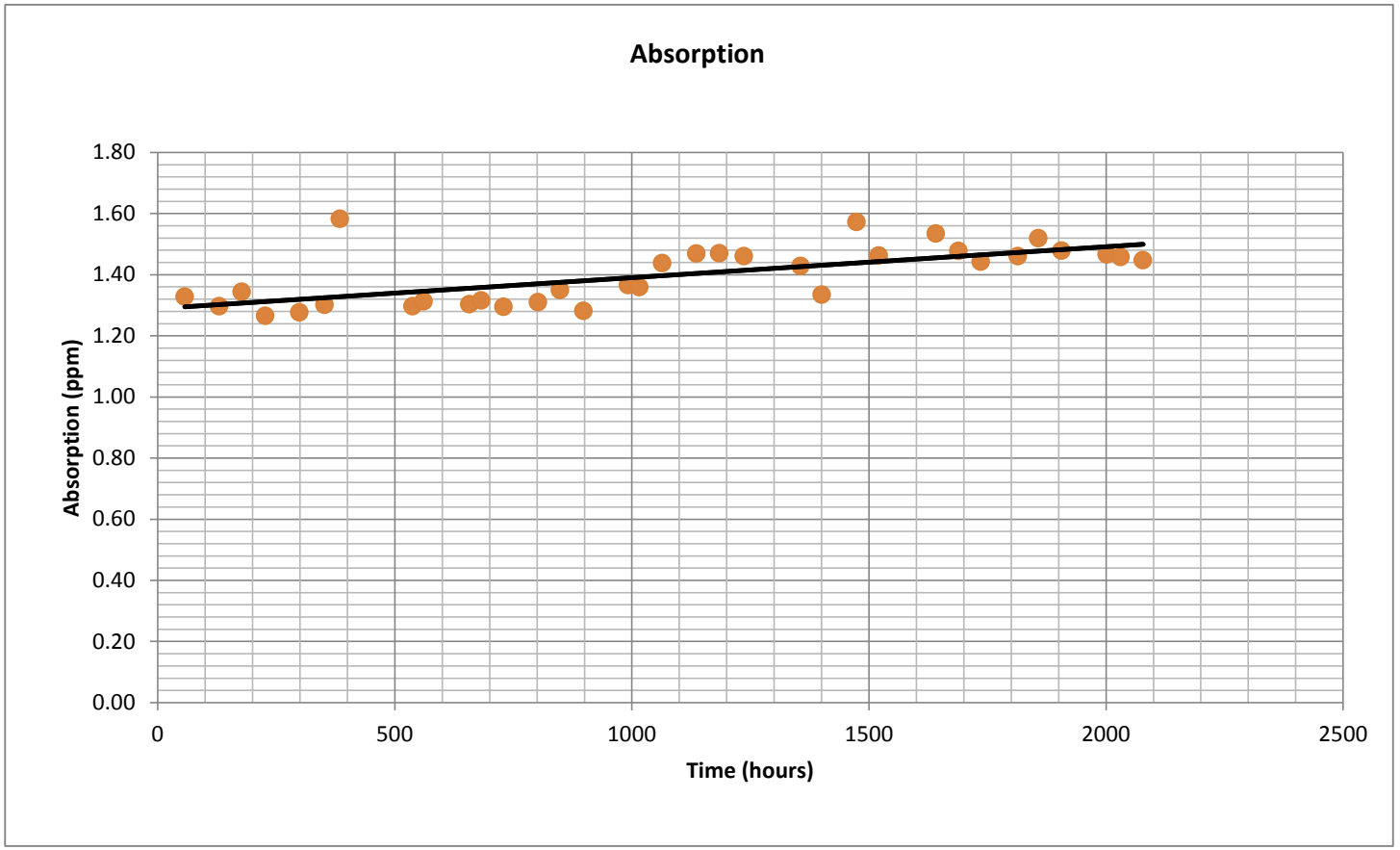
Scaled to LIGO:

LIGO Vacuum Volume	**Vertex**	**LHO Diagonal**	**End**	**Comments**
Quantity (units)	60	77	11	see E1000386-v1 for an estimate of amounts
LIGO ion pumping speed (liter/s)	6800	6800	1700	see E0900398 or PSI V049-1-078 for pump rates
pumping speed ratio (test/LIGO)	0.0036	0.0036	0.0143	does not include cryo-pump and effective pumping from the Beam Tube
max. absorption (ppm/yr)	0.005	0.007	0.004	* Limit is < 0.02 ppm/yr for a single source
max. scatter (ppm/yr)	0.110	0.141	0.080	* Limit is < 0.2 ppm/yr for a single source

* The overall limit on contamination loss on optics for AdL is < 0.5 ppm/yr absorption and < 4 ppm/yr scatter from all sources, per Table 4 of the COC Design Requirements Document (T000127-v1). It is assumed that ~20 sources could contribute.

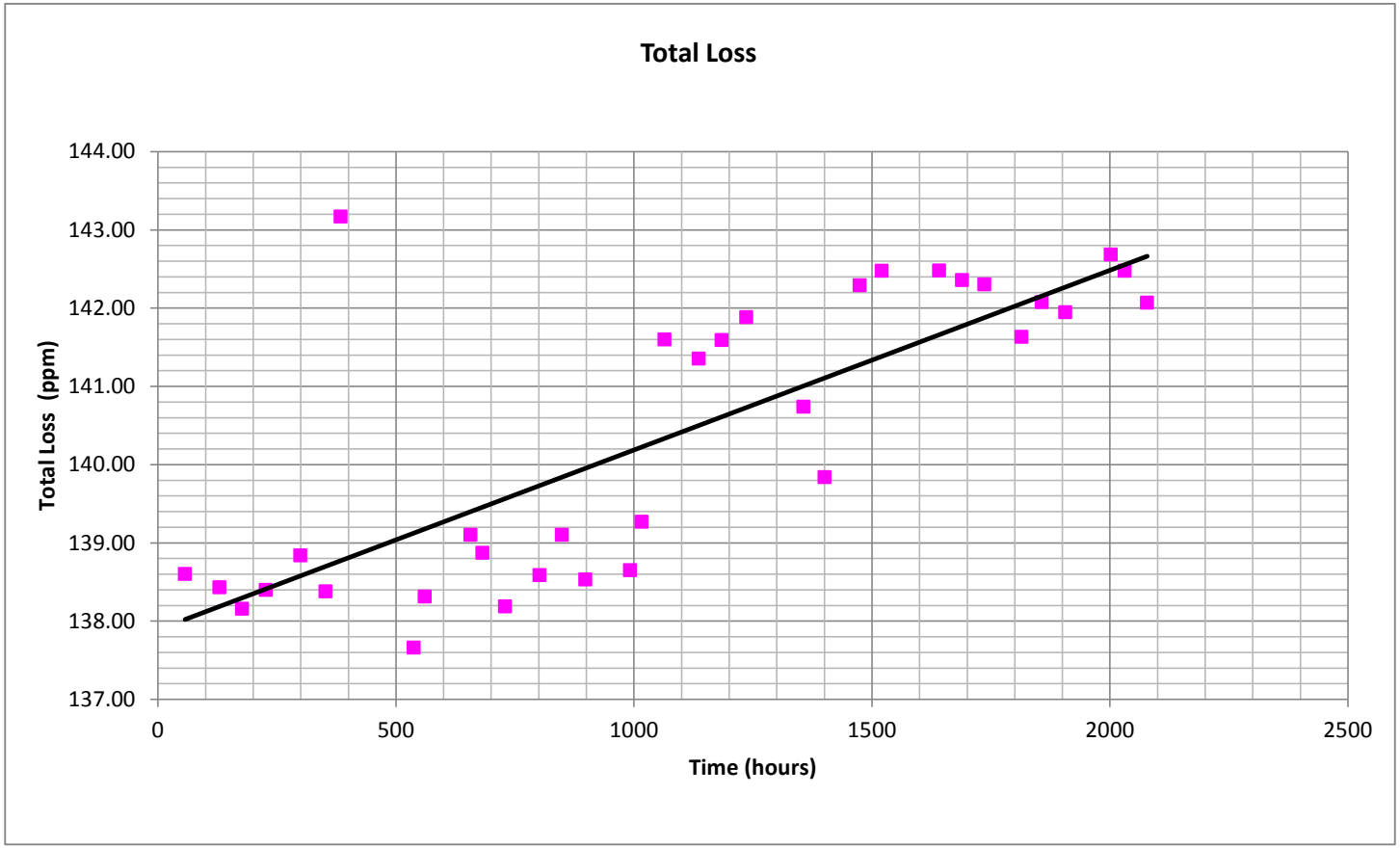
Test Material/Assy./Device: **EP30-2 Bonded Quartz Glass Disks**

Absorption fitting			
Slope	0.000101156	1.288868831	Y-intercept
Standard Error	1.95073E-05	0.024054628	Standard error
r_2	0.45661373	0.069172798	sey
F	26.88996795	32	d_f
ss_{reg}	0.12866516	0.153116029	ss_{resid}
Absorption change rate (ppm/yr)		± sigma (ppm/yr)	
0.9		0.2	



Test Material/Assy./Device: **EP30-2 Bonded Quartz Glass Disks**

Total loss fitting			
Slope	0.002296669	137.8912886	Y-intercept
Standard Error	0.00032563	0.401536275	Standard error
r_2	0.608538601	1.154679584	sey
F	49.74496922	32	d_f
ss_{reg}	66.32421843	42.66511816	ss_{resid}
Total loss change rate (ppm/yr)		± sigma (ppm/yr)	
20.1		2.9	



	Time (hr)	Absorption (ppm)	Total Loss (ppm)	EP30-2 Bonded Quartz Glass Disks
1	57	1.33	138.60	
2	129.5	1.30	138.43	
3	177	1.34	138.16	
4	226.5	1.27	138.40	
5	299	1.28	138.84	
6	352	1.30	138.38	
7	384	1.58	143.17	
8	537.5	1.30	137.66	
9	560.5	1.31	138.31	
10	657	1.30	139.10	
11	682	1.32	138.87	
12	729	1.29	138.19	
13	802	1.31	138.59	
14	848.5	1.35	139.10	
15	898	1.28	138.53	
16	992	1.37	138.65	
17	1016	1.36	139.27	
18	1064	1.44	141.60	
19	1136	1.47	141.35	
20	1184.5	1.47	141.59	
21	1236	1.46	141.89	
22	1356	1.43	140.74	why must this line be hard coded?
23	1400.5	1.34	139.84	
24	1474	1.57	142.29	
25	1520.5	1.46	142.48	
26	1641	1.53	142.48	
27	1689	1.48	142.36	
28	1736	1.44	142.30	
29	1814	1.46	141.63	
30	1857	1.52	142.08	
31	1906	1.48	141.95	
32	2001.5	1.47	142.68	
33	2031	1.46	142.48	
34	2078	1.45	142.07	
35	#N/A	#N/A	#N/A	
36	#N/A	#N/A	#N/A	
37	#N/A	#N/A	#N/A	
38	#N/A	#N/A	#N/A	
39	#N/A	#N/A	#N/A	
40	#N/A	#N/A	#N/A	