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**New Folder Name** MIRROR Contamination

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## Mirror Contamination Test Status

Chamber #	Current Specimen	Outgassing Exposure Test	High Intensity Exposure Test	Next Specimen
1	Control	<0.4 ppm/wk	OK @ 6.4 MW/cm <sup>2</sup>	new mirrors @ high intensity
2	Viton Spring (no postcure)	<0.4 ppm/wk	OK @ 400 kw/cm <sup>2</sup>	Viton Spring (new postcure)
3	RTV 615 (small cubes)	<0.4 ppm/wk	OK @ 400 kw/cm <sup>2</sup>	RTV Spring
4	(under assembly)	1st	2nd	New Control
5	(under assembly)	1st	2nd	Teflon-insulated wire
6	(under assembly)	1st	2nd	P-E vacuum epoxy

- Outgassing exposure limit assumes constant deposition rate onto surface; finite adsorption time could reduce degradation rate as mirror surface equilibrates with any contaminants.
- High intensity exposures were done after outgassing exposure tests; mirrors needed to withstand 100 hr exposure without serious degradation.
- Concurrent development proceeding on improvements to experimental method:
  - improve sensitivity of tests by using better test mirrors,
  - design cavities to increase optical electric field at one mirror in cavity,
  - develop capability for pursuing high intensity exposure tests in parallel.

## Properties of Proposed Contamination Test Cavities

Assume input mirror transmission of 30 ppm, output mirror transmission of 10 ppm, same loss (scattering and absorption) on both mirrors. Spacer length is 50 cm.

Loss/Mirror	Cavity Gain	$\tau_E$ ( $\mu s$ )	Visibility	Throughput
5 ppm	48,000	67	0.97	0.48
10 ppm	33,000	56	1.00	0.33
15 ppm	24,000	47	0.98	0.24
20 ppm	19,000	42	0.94	0.19