

LIGO E-Document Number: [E1000194-v1](#)

**Sample Test:**

|                                |        |   |                |                             |
|--------------------------------|--------|---|----------------|-----------------------------|
| <b>Material under test:</b>    |        | <b>Nichrome (nickel-chromium) Wire wrapped around a Fused Silica Rod (heated)</b> |                |                             |
| units                          |        | 0.1   | TM ring heater | sample was about 10 cm long |
| absorption                     | 0.9 ±  | 0.1   | ppm/yr         | 1 sigma                     |
| scatter                        | -1.9 ± | 1.7   | ppm/yr         | 1 sigma                     |
| max. normalized absorption     |        | 1.10E+01  | ppm/yr/unit    | 2 sigma                     |
| max. normalized scatter        |        | 1.50E+01  | ppm/yr/unit    | 2 sigma                     |
| test turbopump speed (liter/s) |        | 8   | torr/liter/sec | small ion pump was used     |

**Scaled to LIGO:**

| LIGO Vacuum Volume               | Vertex | LHO Diagonal | End    | Comments  |
|----------------------------------|--------|--------------|--------|---|
| Quantity (units)                 | 2      | 2            | 1      |   |
| LIGO ion pumping speed (liter/s) | 6800   | 6800         | 1700   | <a href="#">see E0900398 or PSI V049-1-078 for pump rates</a>       |
| pumping speed ratio (test/LIGO)  | 0.0012 | 0.0012       | 0.0047 | does not include cryo-pump and effective pumping from the Beam Tube |
| max. absorption (ppm/yr)         | 0.026  | 0.026        | 0.052  | * Limit is < 0.02 ppm/yr for a single source                        |
| max. scatter (ppm/yr)            | 0.035  | 0.035        | 0.071  | * 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 significant sources could contribute.](#)

The nichrome wire was supplied with about 2 times the expected operating current for the ring heater.

This test was conducted in cavity 1 between 11/15/2006 and 3/2/2007

The part has no RGA scan. It is not clear whether it was baked prior to the optical contamination cavity test (although it would certainly have been cleaned).