# Optical Table Load in Beam Splitter Tank

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A rough estimate of the losd for the optical table in the beam splitter tank is given in Table 1. Here are a few comments:

- The mode cleaner test mass (Line 1), the beam splitter (Line 8) and the compensation plates (Line 9) are assumed to be fused silica plates 2.5" thick and 8" in diameter.
- the Pockels cells (Line 5) are assumed to have 20 mm clear aperture. Their weight is scaled up by a factor $4^3 = 64$ from the weight of the 5 mm Pockels cells we currently use (which includes a light weight aluminum mount).
- The Faraday isolators (Line 6) are assumed to have 20 mm clear aperture. Their weight is sscaled up by a factor 64 from the weight of the 5 mm Optics for Research isolators we currently have.
- The weight including additional seismic isolation is obtained by assuming that each component is separately suspended from its own isolation stack, which has a mass equal to twice the mass of the component.

| | Component | Quantity (units) | Weight/unit (kg) | Weight (kg) |
|---|---|---|---|---|
| 1 | Mode cleaner test mass | 1 | 4.5 | 4.5 |
| 2 | Expanding telescope | 1 | 2 | 2 |
| 3 | Wave plate | 1 | 0.3 | 0.3 |
| 4 | Pick-off | 3 | 2 | 6 |
| 5 | Pockels cell | 3 | 5 | 15 |
| 6 | Faraday isolator | 3 | 64 | 192 |
| 7 | Mode matching telescope | 1 | 10 | 10 |
| 8 | Beam splitter | 1 | 4.5 | 4.5 |
| 9 | Compensation plate | 2 | 4.5 | 9 |
| 10 | Total weight | | | 243.3 |
| 11 | Including seismic isolation | | | 729.9 |
| 12 | For two sets of optics | | | 1459.8 |

Table 1: Estimate of load for optical table supporting the optics in the beam splitter tank