

*LIGO Laboratory / LIGO Scientific Collaboration*

LIGO- T080152-00-U

**ADVANCED LIGO**

8<sup>th</sup> May 2008

**Questions preliminary design review of silica masses  
for advanced LIGO**

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Rev --	--	--

**Color coding:**

Black Design questions

Red Lingual amendments

Blue General questions

**Questions:****Document T080098-00-K**

1. page 3 section 1.3 1<sup>st</sup> bullet **2<sup>nd</sup> sentence is a strange sentence**
2. page 3 section 1.3 2<sup>nd</sup> bullet **Why is a change to silica proposed for the ERM? Is the reduction of mass not a problem dynamically speaking?**
3. Page 3 section 1.3 4<sup>th</sup> bullet **Is rounding the prisms to conform to the cylindrical ERM barrel cheaper than making flats on the sides even if we choose not to place strict requirements on the flatness, since we are choosing VacSeal as the baseline adhesive?**
4. Page 3 section 1.5 3<sup>rd</sup> paragraph **This means that there will be grooves underneath the prisms. Is this not a problem?**
5. Page 3 section 1.5 4<sup>th</sup> paragraph **...add “and for blade suspension settings”???**
6. Page 4 section 1.6 1<sup>st</sup> paragraph **Should there be a LIGO document reference to the optics there?**

**ERM****Document E080089-D**

7. Page 1 section 3 Wire groove separation **Should it be specified where the measurement is taken? It seems to me that ideally the groove separation should be measured close to where the wires first touch the mass a couple of centimeters (inches) above and below the prism position (3 o'clock and 9 o'clock reference lines)**
8. Page 1 section 3 **Should the inspection document also include a measurement of the mass of the ERM/ITM/ETM as this couples with the blade suspension?**

**Document T080048-03-K**

9. Page 2 section 1 4<sup>th</sup> bullet **See question 3 and 5 in Document T080098-00-K**
10. Page 3 Section 5.1 **What is the reason for this strict cylindricity requirement? Has it something to do with the dynamics?**
11. Page 4 section 5.2 **The definition of the thickness of the mass is fine with me as long as the two faces are parallel (there is no parallelism requirement in the drawings).**
12. Page 4 section 5.5 **Why could the wire grooves requirement be relaxed? Is it dynamically not a problem?**

13. Page 5 section 5.8 **The angular tolerance of  $\pm 0.1^\circ$  on the reference grooves can give a maximum vertical offset of the prisms of  $\pm 0.3$  mm. Check: is this acceptable?**
14. Page 5 section 6 **See question 2 in Document T080098-00-K.**
15. Page 6 section 6 **So how will the packaging be incorporated? Will this be discussed separately and will this not be included in the contract with the mirror manufacturers?**

### Document D080116

16. **In the drawing there is no mention on how the wire grooves should be made: etch, grind, sandblast? Is it prudent to define that a final stage in the manufacture of the wire grooves should be an etching stage to remove possible cracks, since the grooves will be loaded with the wire?**

### ETM/ITM

#### Documents E080090-D/E080112-D

17. Page 1 Section 3 Wire groove separations **Should it be specified where the measurement is taken? It seems to me that ideally the wire groove separation should be measured close to the bonding flats since that is where the wire will touch down onto the mass.**
18. Page 1 section 3 **Should the inspection document also include a measurement of the mass of the ERM/ITM/ETM as this couples with the blade suspension?**

#### Documents T08047-02-K

19. Page 2 section 1 7<sup>th</sup> bullet **“grooved” should be “grooves”?**
20. Page 4 section 5.4 **I think the important dimension to specify is the distance between the flats, since this defines the parallelism of the fibres. NOT AS DONE IN THE CURRENT DRAWING. Why would the flat length be important?**
21. Page 6 section 5.8 **I am confused by the usage of 12 and 6 o'clock. 12 o'clock for me would be the top of the mass and not the flat side of the mass (should this be 3 o'clock and 9 o'clock?)**
22. Page 6 section 5.9 **State that flatness must be measured with a beam of wavelength 633 nm and that flatness requirement is P-V. This has been done correctly in the drawing and component specification.**

### Document D080117/D080128

23. **In the drawing there is no mention on how the wire grooves should be made: etch, grind, sandblast? Is it prudent to define that a final stage in the manufacture of the wire grooves should be an etching stage to remove possible cracks, since the grooves will be loaded with the wire?**