

Material Qualification Queue

as of 28 Feb-2011
in priority order

IN-TEST:

1. a) RTD device (Omega #1PT100KN1510CL1/3)
for TCS temperature measurement
platinum wire wound
embedded in alumina?
b) Fiberglass insulated RTD extension cable (Omega # PN EXGG-4CU-26S)
for TCS temperature measurement
2. EG&G YAG-444A -- the proposed diodes for the arm cavity baffle
Bob to order ASAP
3. Nedox SF-2 coating (by General Magnaplate) Coating Material for TCS in-
vacuum relay mirror (will be applied to the I.D. and O.D. surfaces of a .50" tube)
There will be six specimens, each 16" long for testing

QUEUE

4. Conner wire, kapton/polyimide wire (28 awg), part number CW6951rev1.
(has a yellow color, rather than the more usual amber color)

LIGO-C0900156: [RFQ No. SM-150, entitled "LIGO 28AWG In-Vacuum Wire" submitted to Cooner Wire Inc.](#)

LIGO-T0900298-v1: [Specification for 28AWG Kapton Insulated Wire](#)

5. RG-316 (Allied)
Rich Abbott ordered a spool. Chub asked to give to Bob 10/1.

1. **Manufacturer** - Allied Wire and Cable
<http://www.awcwire.com/Part.aspx?code=213F27F27J34>

2. **Materials:**

Part Number RG316

Conductor Stranding 7/.0067

Nom. Dia. of Cond. 0.021

Dielectric (in) 0.06

Nom. O.D. (in) 0.102

Nom. Imp. 50 ohms

Approx LBS/MFT 11 (I think this should be kFt)

Nom. Cap. (pF/ft) 29.4

Shield Material: Silver-Coated Copper

Conductor Material: Silver-Coated Copper Clad Steel

Dielectric Material: Polytetrafluoroethylene (PTFE)
Jacket Material: Fluorinated Ethylene Propylene (FEP)
Shield: Overall Braid Shield
Min. Temp -55°C
Max. Temp 80°C

3. **Application:** In vacuum LSC and ASC detectors

4. **Quantities:**

The anticipated length for each coaxial bundle in vacuum is ~15ft.

Each LSC detector uses a bundle of 5 individual RG316, there are 2 LSC in-vacuum detectors per IFO

Each ASC detector uses two bundles of 5 individual RG316, there are 4 ASC in-vacuum detectors per IFO

Total lengths of cable(#detectors*connectors per detector*length*# of coaxial cables)

$2*1*15*5 = 150$ feet for LSC per IFO

$4*2*15*5 = 600$ feet for ASC per IFO

Grand total of 150 + 600 = 750 feet of coaxial cable per IFO

5. This is an identified need, must have.

6. Ferrite Material

No currently defined need – would be nice to have qualified just in case

Rich Abbott needs to provide a significant number of samples (10 - 20 units) from a known source with a known material grade.

Ferrite materials are based on "Nickel-Zinc" and "Manganese-Zinc". Zinc has a high vapor pressure.

One possibility is BN-43-7051 is a Balun (binocular or multi-aperture) core sold by many companies, such as Amidon Corp.:

<https://www.amidoncorp.com/specs/2-34.pdf>

where "43" refers to the material.

Material 43 is a NiZn ferrite material:

http://www.cwsbytemark.com/CatalogSheets/Ferrite_datasheet_oct06/FR_MATL.pdf

<http://www.fair-rite.com/newfair/materials43.htm>

7. Copper & polyimide clad fiber optic, IVG Fiber CU1300.

Not yet a baseline element for aLIGO.

Brian Lantz wants to test this material for use with an optics table, optical lever system. Not yet a baseline element for aLIGO. Could be used for ALS etc. Likely "inherently" vacuum compatible, but worth checking since it has a polymer.

8. Tungsten carbide/carbon (WC/C) sample (for potential BSC-ISI tooling use (class b) but perhaps useful in vacuum as well) (had small sample -- likely inadequate in

size probably inherently vacuum compatible)

No currently defined need – would be nice to have qualified just in case

9. Cesium sample (composite ceramic of SiC, Si and C) possibly inherently vacuum compatible application is not clear (high stiffness to weight structure) (sample size adequate?)

No currently defined need – would be nice to have qualified just in case