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BaBar TNDC-96-27

First Look at Al/Au and Au/W Wire for the BaBar Drift Chamber

We purchased 2000 ft of each of the three types of wire currently planned for use in the drift chamber:

1. 0.0008″ gold-plated tungsten, EE finish, from Thermionic Products.
2. 0.0032″ gold-plated 5056 aluminum wire, strained relieved and Ultra-finished from California Fine Wire.
3. 0.00472″ gold-plated 5056 aluminum wire, strained relieved and Ultra-finished from California Fine Wire.

We have looked at a few short pieces of these and other wires with an Amray 1200B scanning electron microscope, and find surface defects that may be of concern. Further studies are certainly needed, but we may need to interact quickly with vendors to determine if improved wire can be obtained.

Six photographs appear on the following pages. Draw your own conclusions.

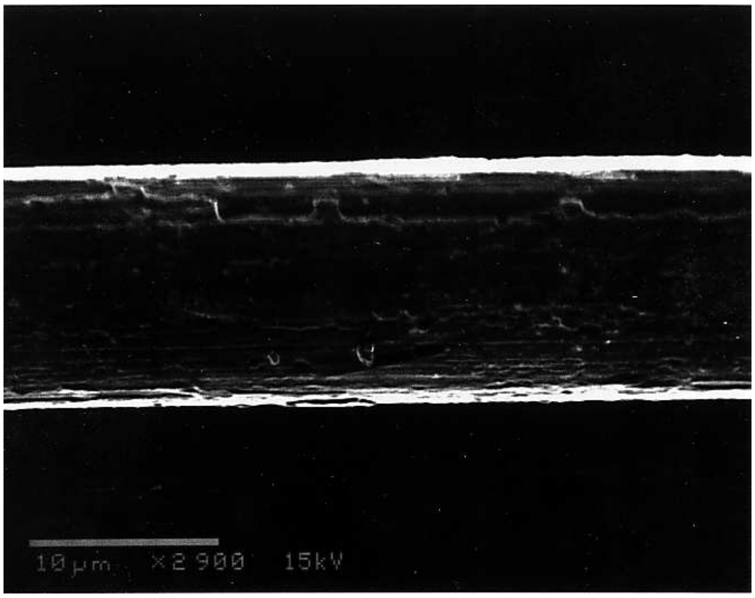

Figure 1: 0.0008″ gold-plated tungsten wire from Thermionic Products.

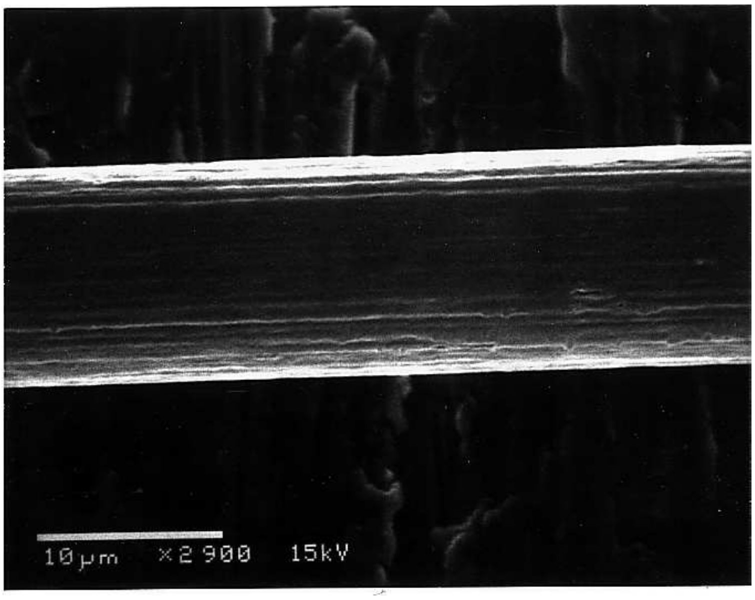

Figure 2: 0.0008″ gold-plated tungsten wire from Luma. This wire has been preferred in the past by CLEO, the SSC, and Princeton U.

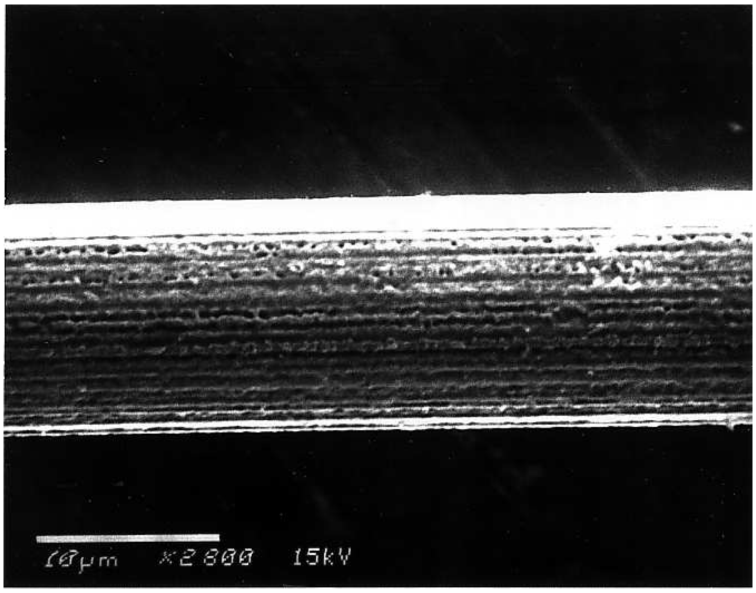

Figure 3: 0.0008″ gold-plated tungsten wire from GE. This wire has led to poor performance in chamber built years ago at Princeton U.

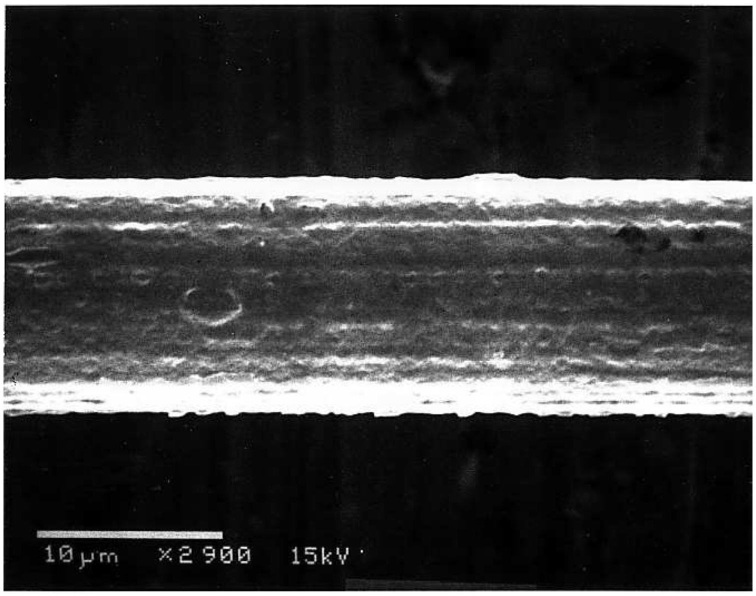

Figure 4: 0.0008″ gold-plated tungsten wire from Philips Elmet. This wire has also led to poor performance in chamber built years ago at Princeton U.

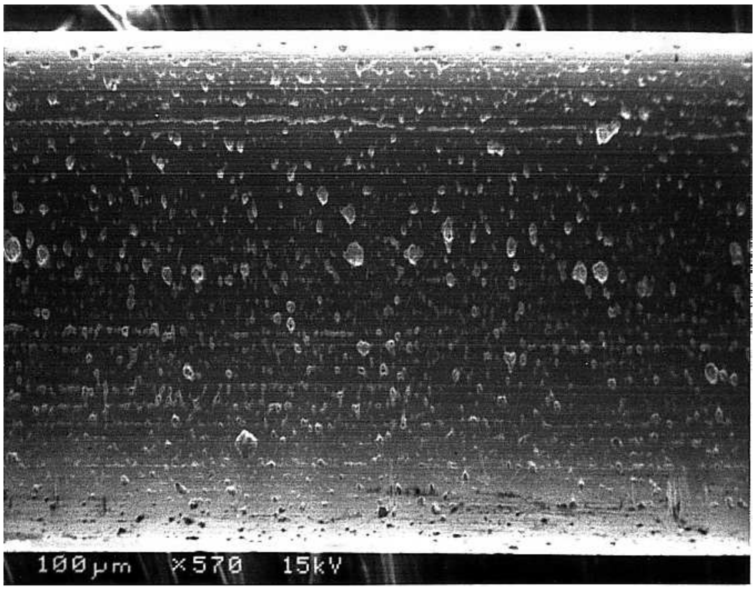

Figure 5: 0.0032″ gold-plated aluminum wire from California Fine Wire. Observe massive cratering on the scale of a few microns.

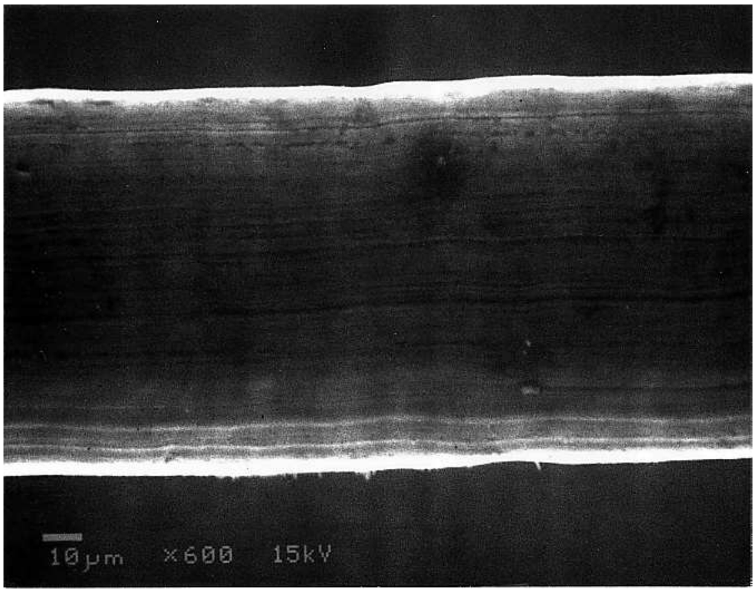

Figure 6: 0.0028″ gold-plated aluminum wire from California Fine Wire. This wire was used in a chamber built by a BNL/Princeton/TRIUMF collaboration around 1990. Negociation lasting $\approx$ 1 year with California Fine Wire were required to obtain consistent good quality wire.