Wire Procurement and Quality Control for the BABAR Drift Chamber

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Field Wires

Order twice nominal length to allow for loss during stringing.

14,208 field wires, 120-μm gold-plated aluminum.

Order 300,000 ft (change diamond dies every 10,000 ft).

7,456 clearing wires, 80-μm gold-plated aluminum.

Order 150,000 ft.

Vendor: California Fine Wire.

Order placed Sept. 20, 1996.

Cost: $129.5k

See Princeton/BaBar/TNDC-96-47.

Quality Control

At least one sample from every spool will be tested as follows:

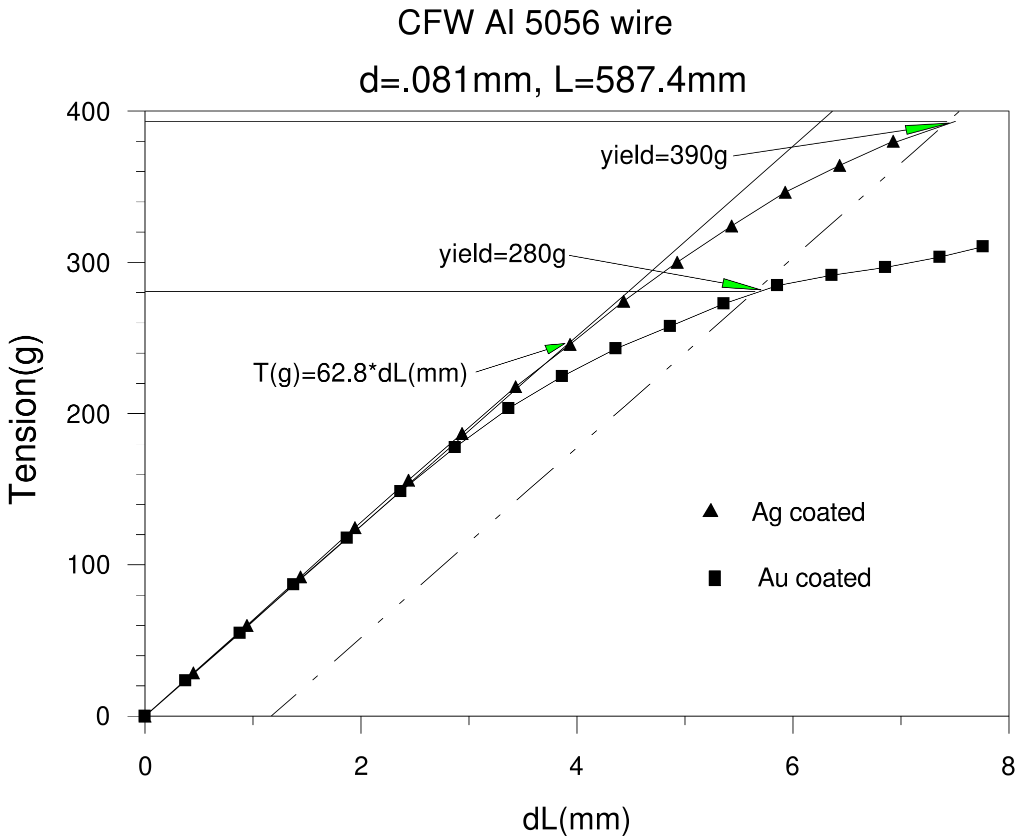
1. Wire diameter: weigh a 1-m length on a Mettler AT1005 Mass Comparator (accuracy: 0.02 mg);
   Determine ρr^2 to 1% $\Rightarrow$ can determine gold-plating thickness on aluminum (but not tungsten) wire.
2. Spring constanst and breaking force: measure elongation *vs.* force with a Mitutoyo micrometer and a Denver Instruments balance interfaced to a PC.
3. Surface appearance: use an Amray 1200B scanning electron microscope; option to perform x-ray analysis.

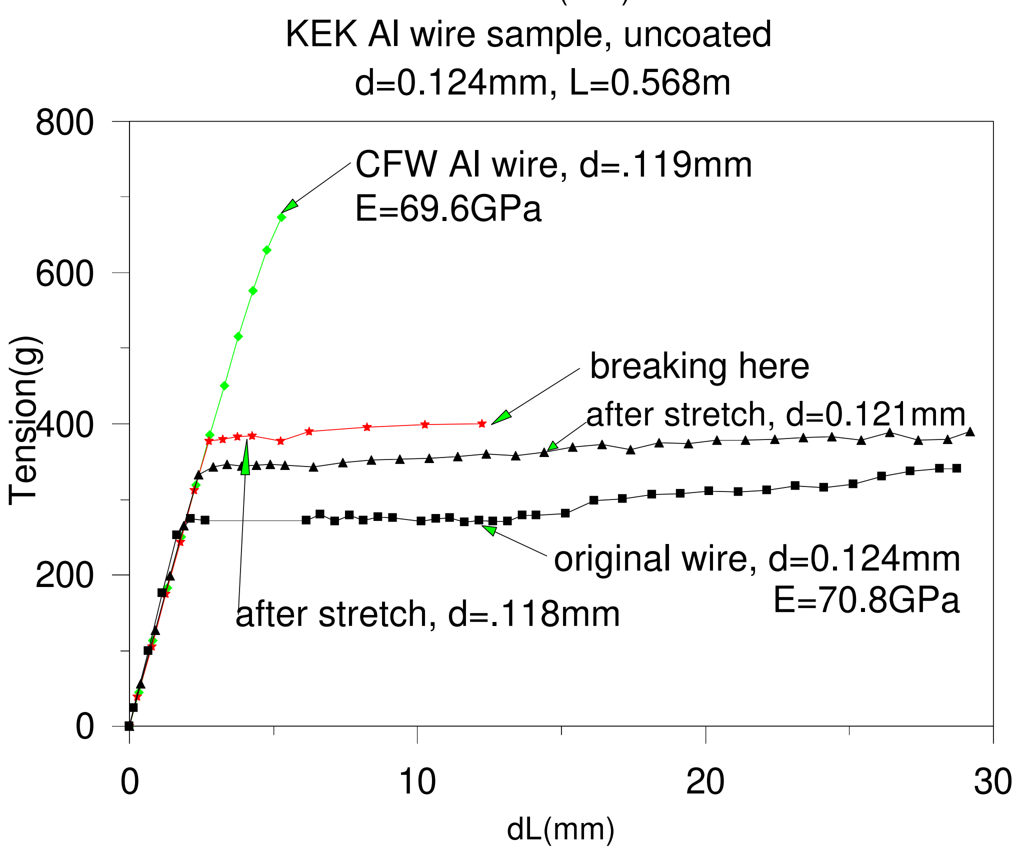
Occasional tests of:

1. Creep.
2. High-voltage behavior.

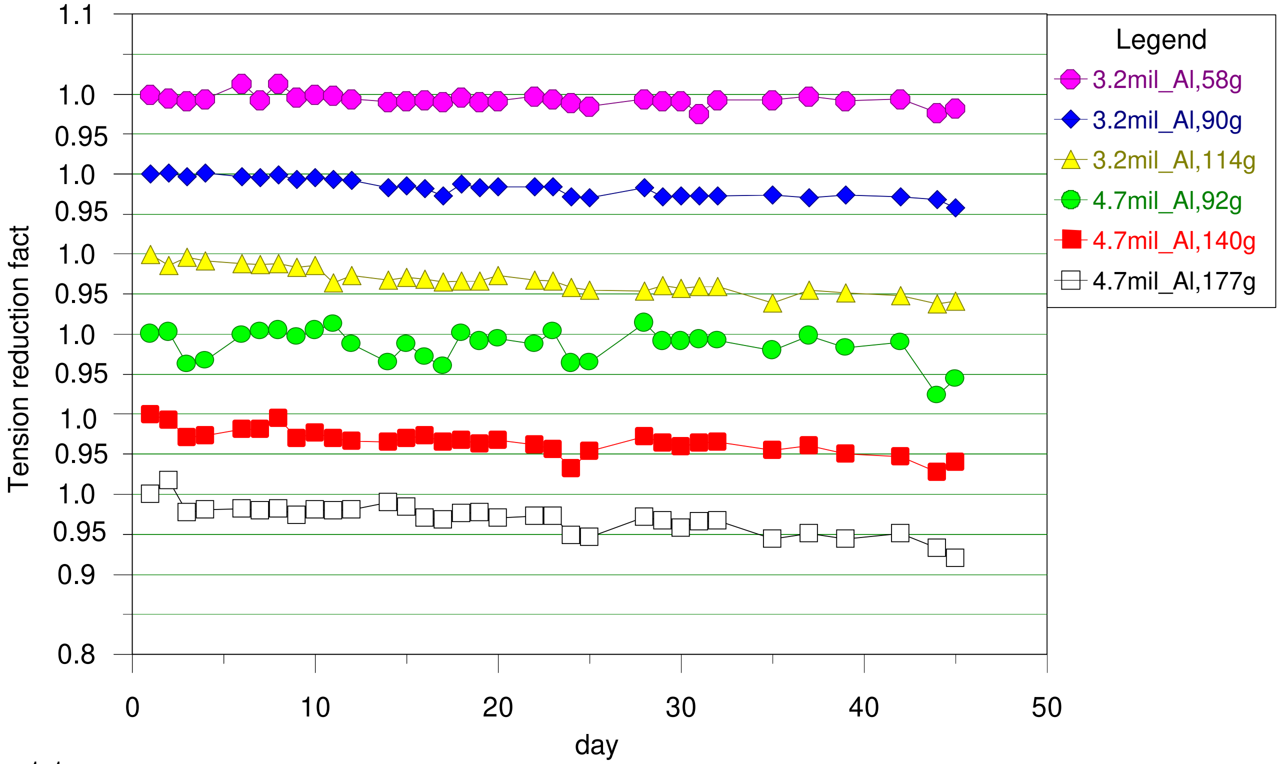
See Princeton/BaBar/TNDC-96-46.

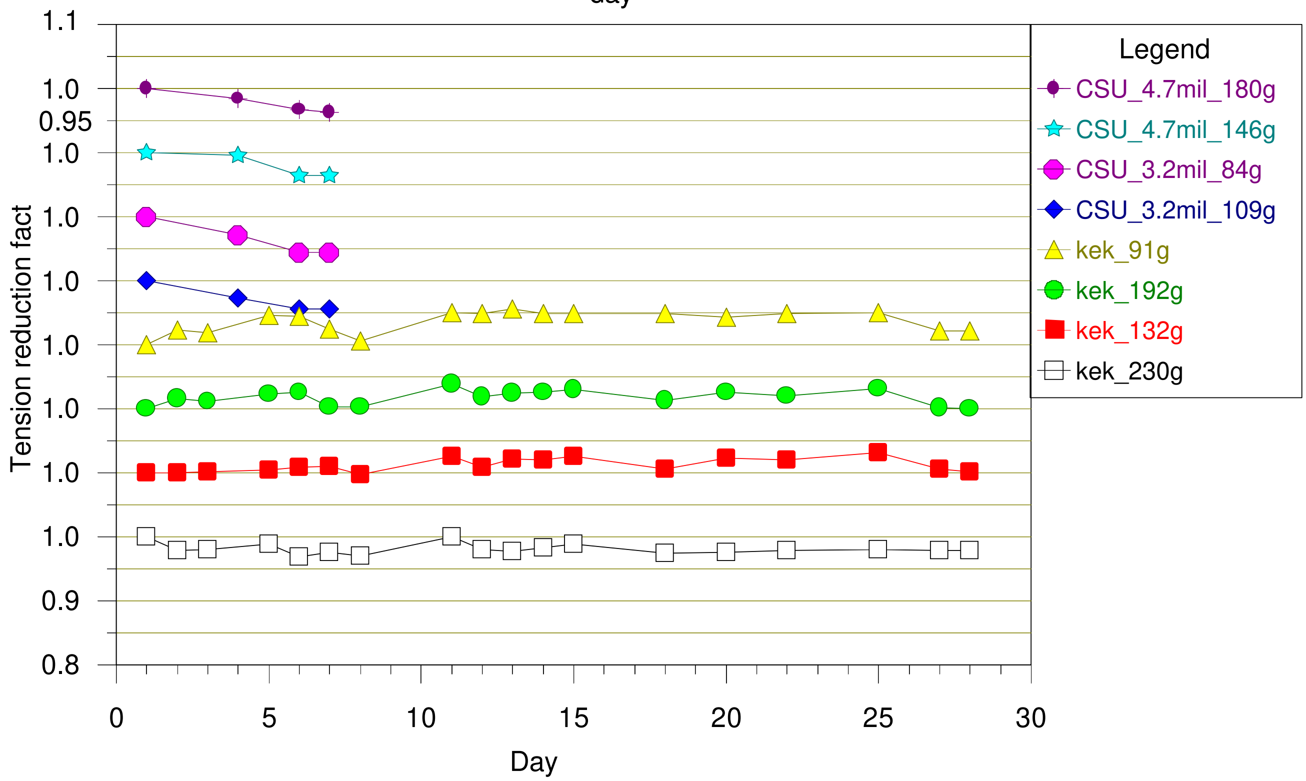
Yield Measurements for Al Wire



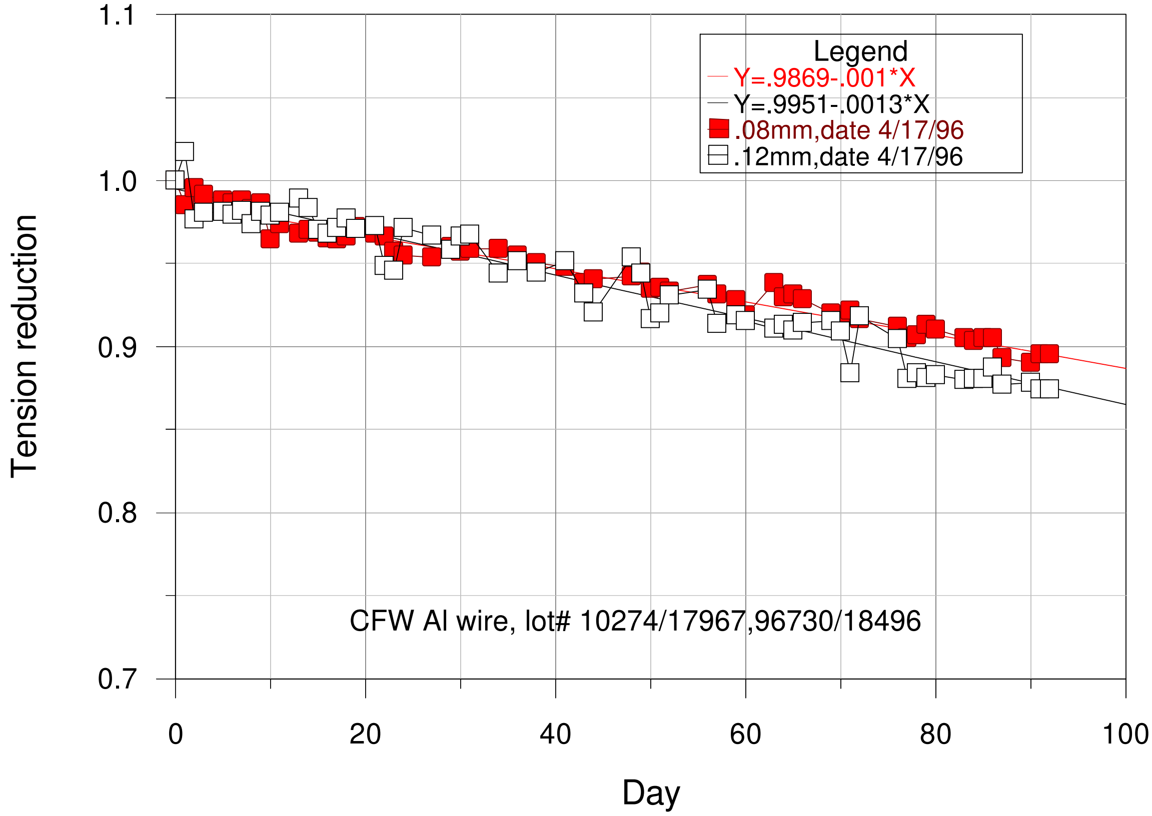


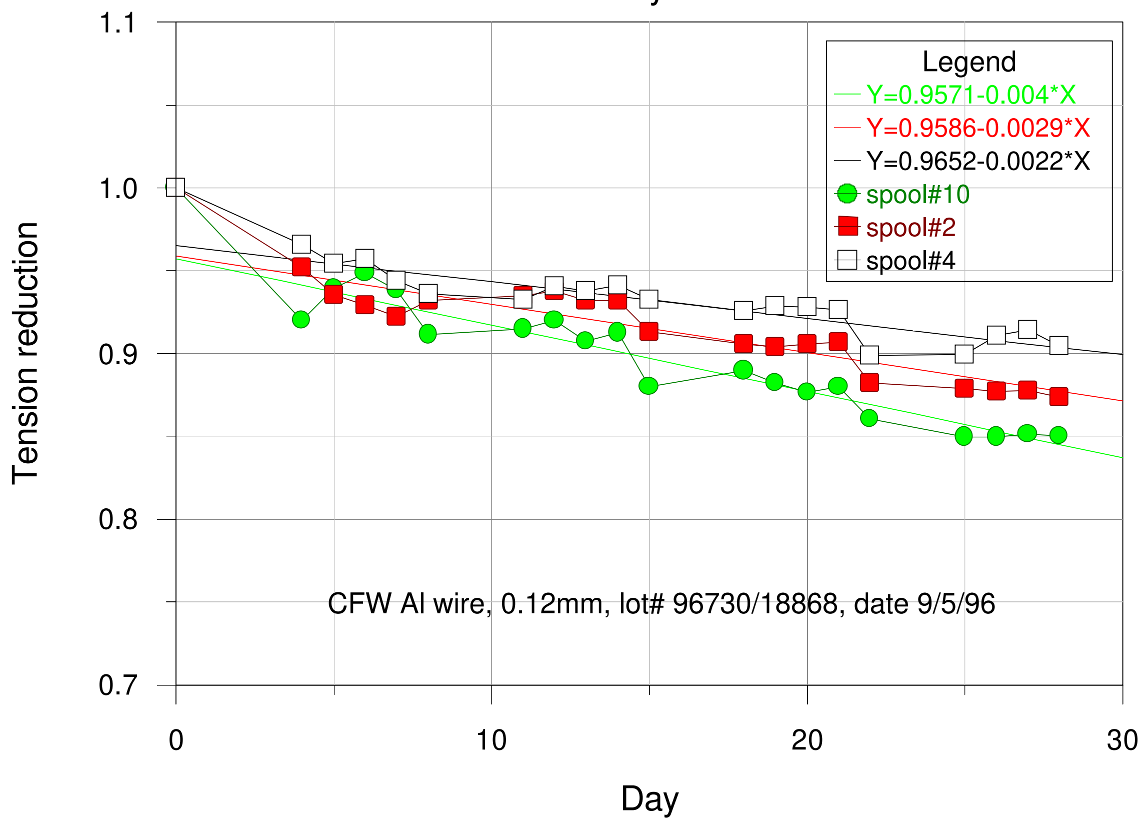
Creep Tests Beginning June 1996





Recent Wire Shows Greater Creep

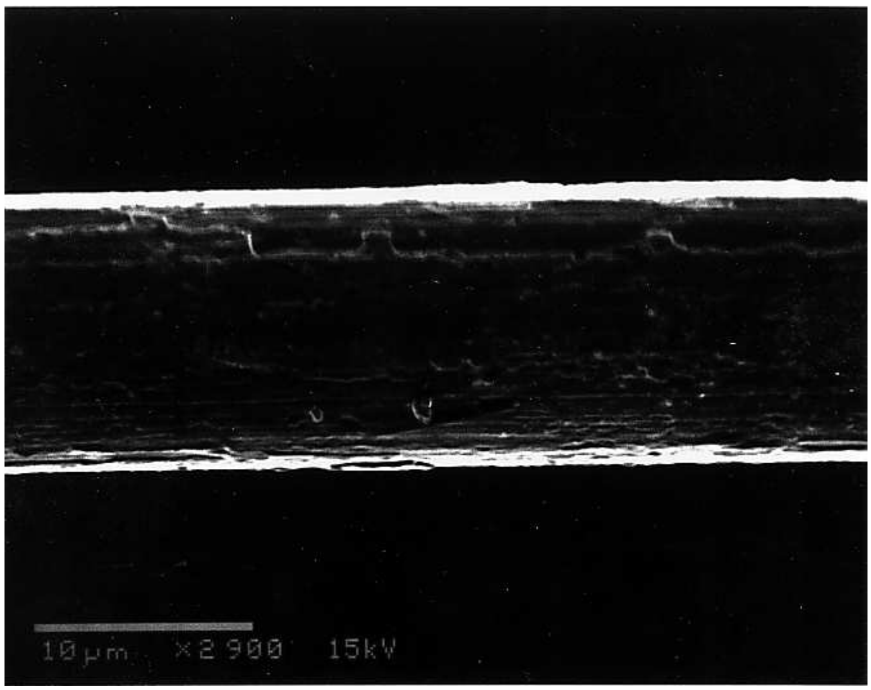


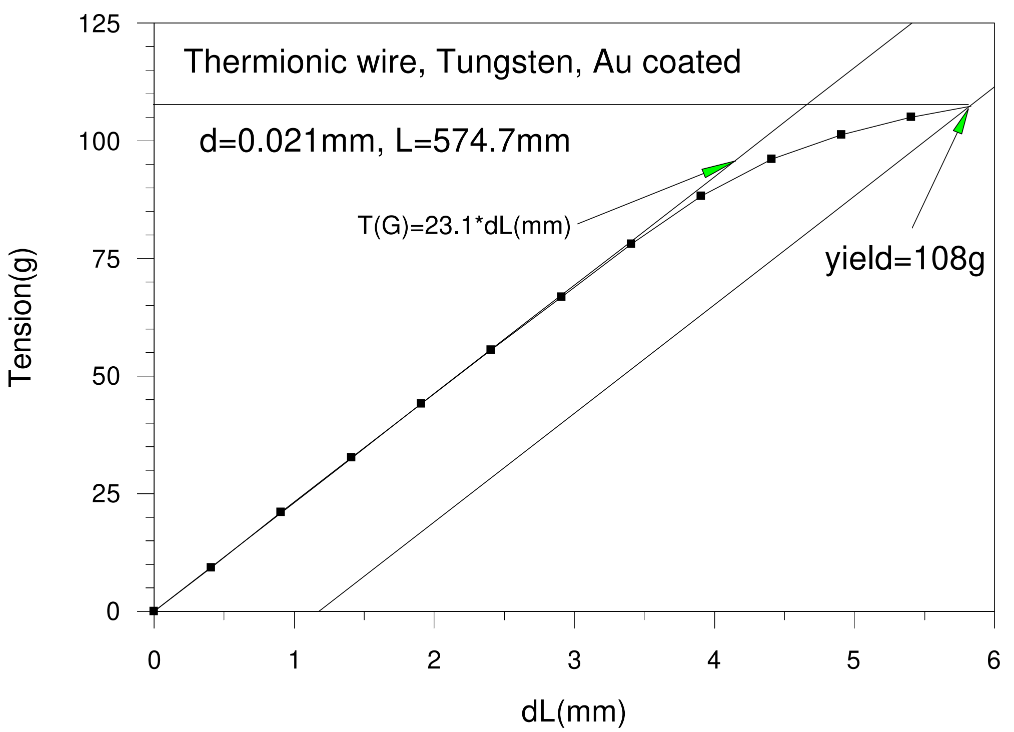


Sense Wires

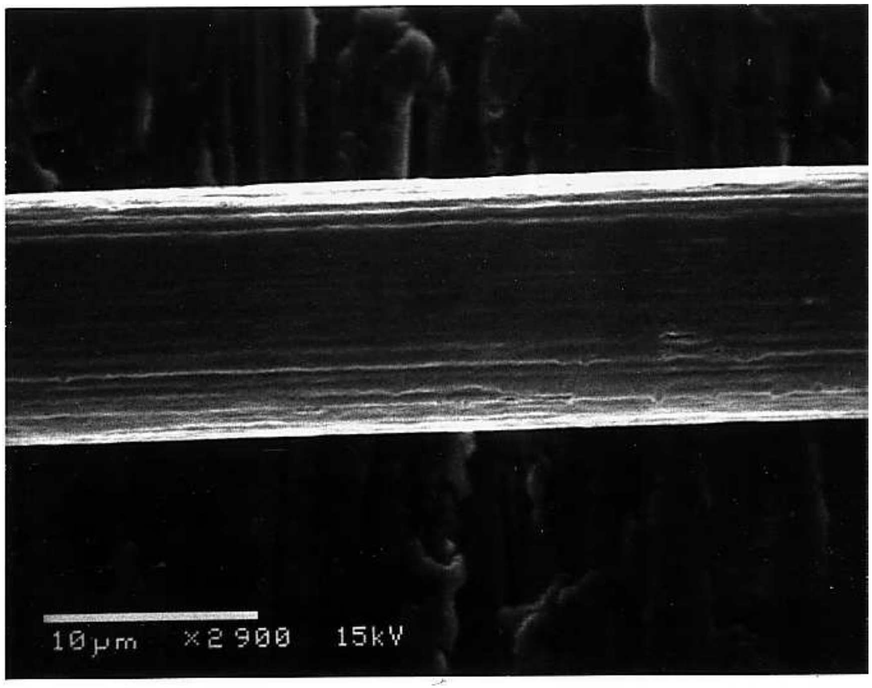
7104 sense wires, 20-μm gold-plated tungsten.

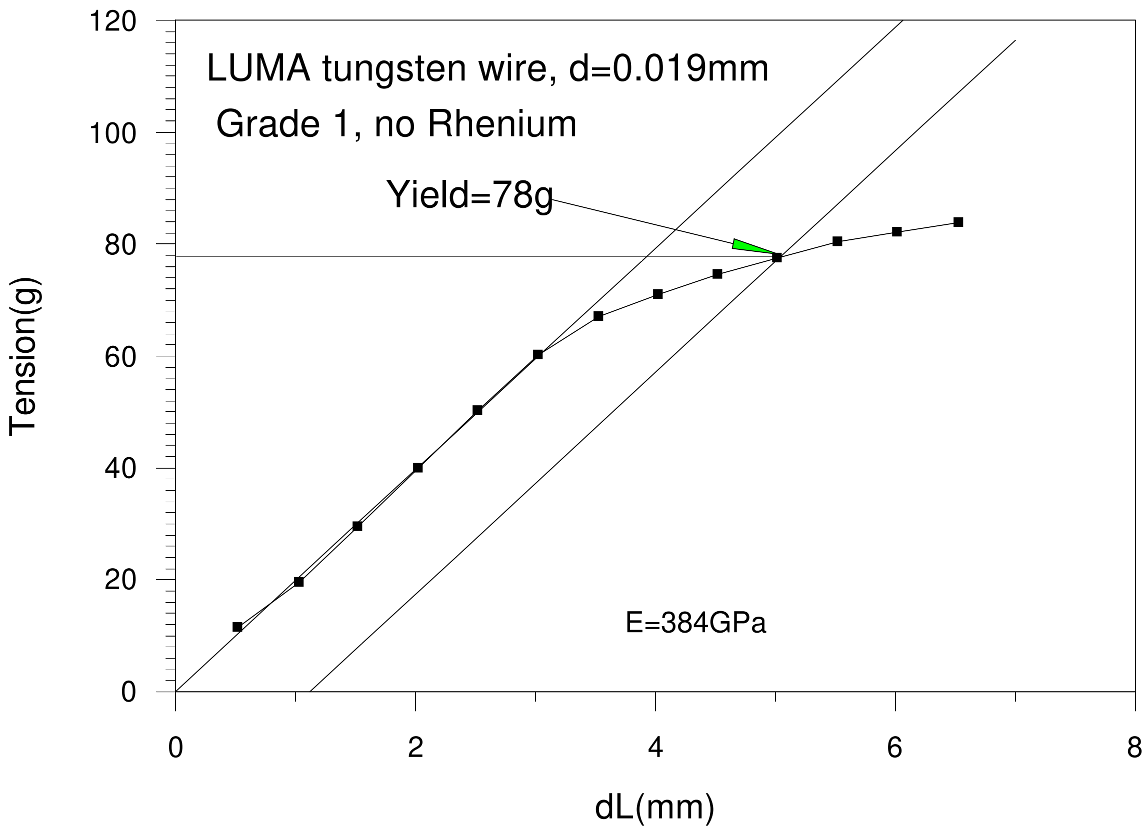
Wire from Thermionics Products; good stiffness.

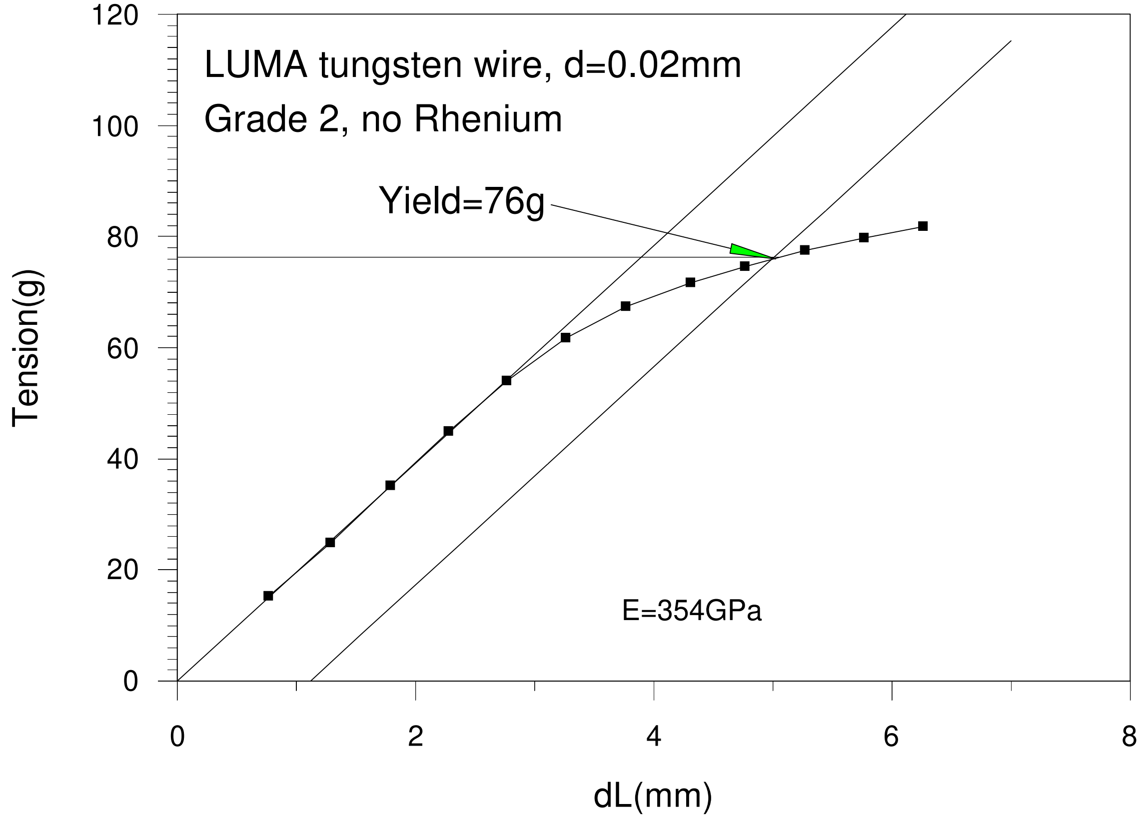


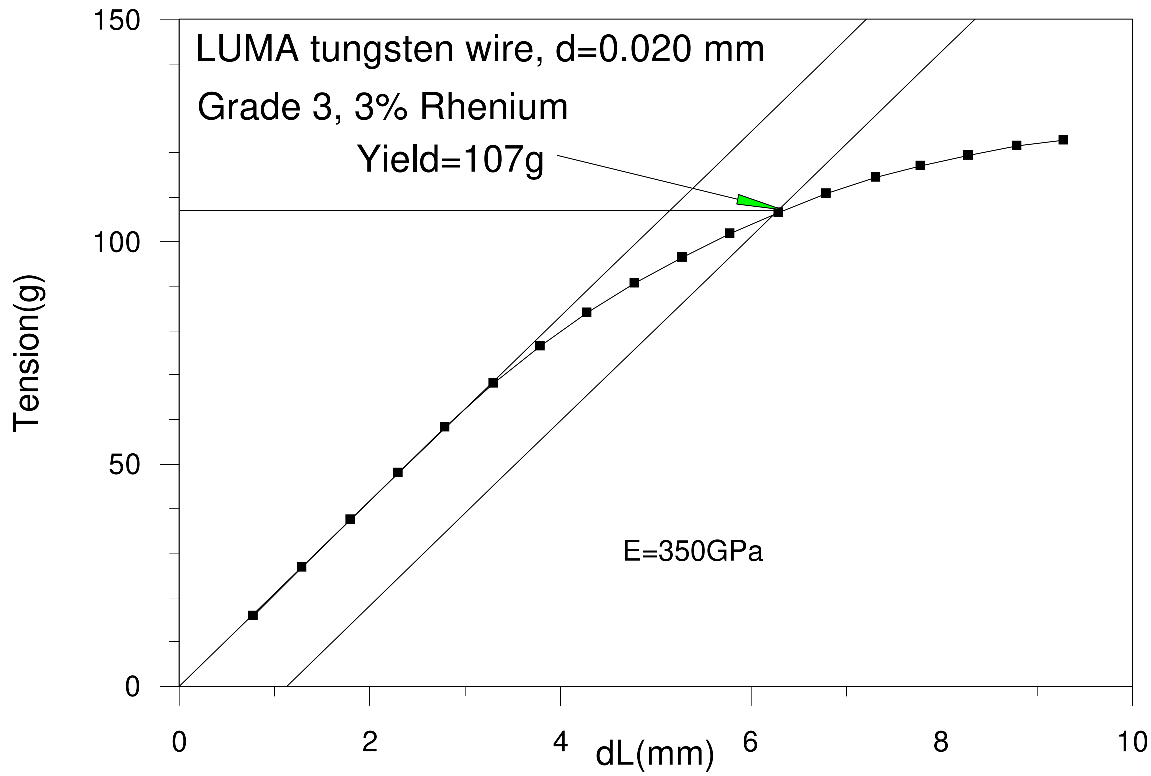


Wire from Luma; better surface but less stiff, lower yield.






LUMA tungsten wire, d=0.02mm
Grade 2, no Rhenium
Yield=76g
E=354GPa
Tension(g)
dL(mm)
0
20
40
60
80
100
120
0
2
4
6
8


LUMA tungsten wire, d=0.020 mm
Grade 3, 3% Rhenium
Yield=107g
E=350GPa
Tension(g)
dL(mm)
0
50
100
150
0
2
4
6
8
10