

# Notes on Vertical test results of cavity TE1ACC001 #02

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## Current test summary

Cavity TE1ACC001 has been tested for the second time after 120 °C in-situ baking.

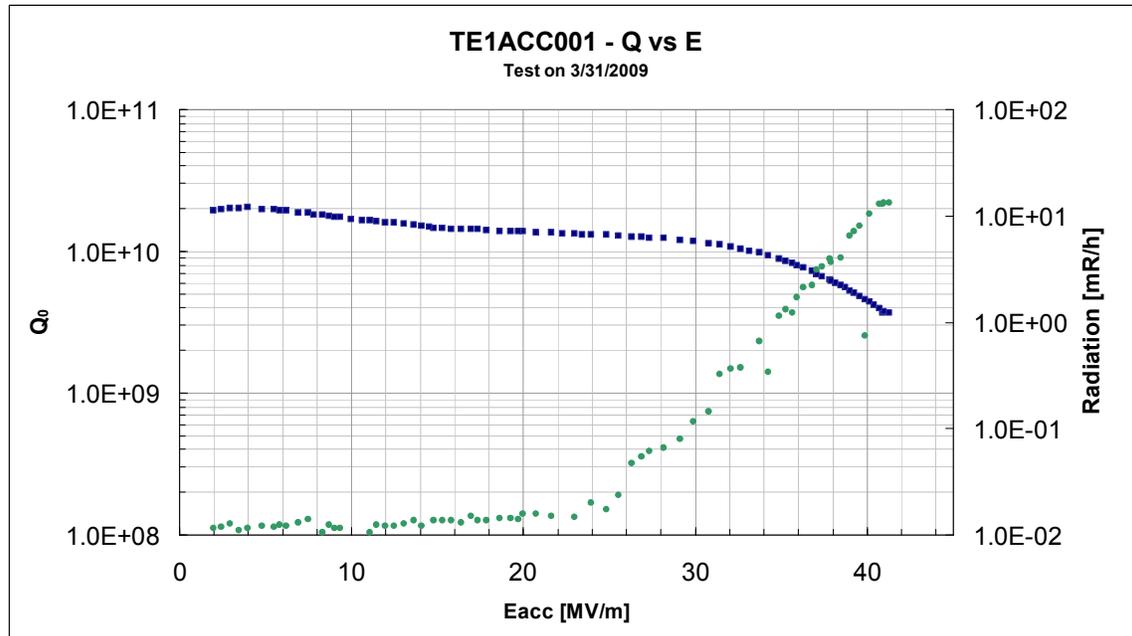


Figure 1: Q and radiation versus Eacc for TE1ACC001 test #2.

During the second test on 3/31/2009, cavity was paired to another cavity and cooled down to 2K with no active pumping. CW power measurement was performed without the Q-T measurement. Low field  $Q_0$  was  $2.02 \times 10^{10}$ . The test continued without multipacting or quench until 24 MV/m when above background x-ray started to appear. There was no quench incident all the way to 40 MV/m where processing of field emission eventually lead to 41.3 MV/m. Beyond that power level, both transmitted and reflected signal became unstable to obtain meaningful data. Thus the test was concluded.

No diagnostic tool was used on this cavity due to the tight schedule of cavity test preparation.

The cavity was kept in vacuum since last test on 3/17/2009. 120 C baking was applied at A0 facility. The worsened x-ray data suggested particulates might be in the cavity which migrated to cell region during the subsequent handling.

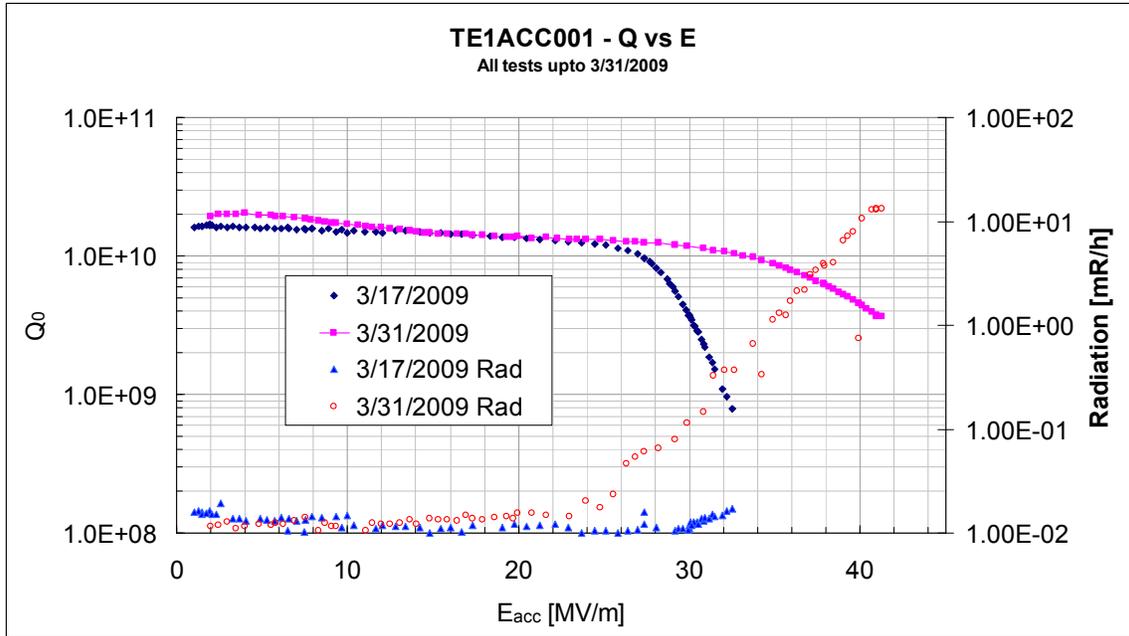


Figure 2: Overall Q versus Eacc for TE1ACC001 tests.

### Previous RF tests

After the cavity was received from ACCEL, it was inspected using camera inspection system developed by KEK and Kyoto University. No significant feature was observed, indicating a high quality manufacturing. Cavity was electropolished at ANL with a bulk material removal of 100  $\mu\text{m}$ . Once the cavity was initially cleaned with ultrasonic soap and 70 minutes high pressure water rinsing, the cavity was inspected again by camera inspection system. There was no significant feature present, and the surface image showed exceptionally high quality of EP etching.

(<http://tdserver1.fnal.gov/genfa/single/images/TE1ACC001/index.html>)

First test was done on 3/17/2009. Performance was at 32.5 MV/m limited by power due to strong q-slope. The above background x-ray was negligible.

(<http://tdserver1.fnal.gov/genfa/single/TeslaSingle/TE1ACC001/TE1ACC001TestNote.pdf>)

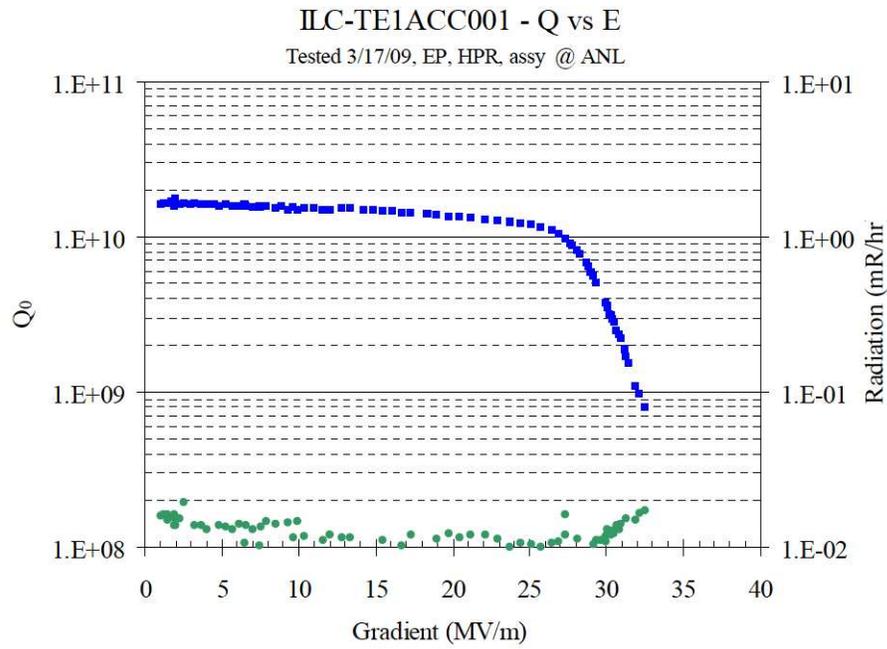


Figure 3: Q and radiation versus Eacc for TE1ACC001 test #1.