

# Vertical Cavity Test Report

<b>Cavity Name</b>	TE1ACC006	<b>Test Date</b>	11/12/2010	<b>Author</b>	J. Ozelis
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## Cavity History

Cavity TE1ACC006 is a single-cell cavity manufactured by RI, using Nb sheets that were shown, by eddy current scanning, to contain detectable defects. The cavity after fabrication was simply US cleaned, HPR'd and assembled for vertical test, where it was found to be power limited (due to low Q) to 15MV/m. No quench at EDS detected defect site observed.

## Last Cavity Process

Cavity was given a HF rinse, then HPR and assembly for vertical test. No low-temperature bake

## Test Conditions

<b>He bath temp</b>	2.00 K	<b>Dewar press</b>	22.9 Torr	<b>Top Plate</b>	#1
<b>Cavity vacuum</b>	Isolated	<b>LHe level</b>	95"		

## Calibration Data

<b>Cal. field (MV/m)</b>	3.4	<b>Q<sub>1</sub> (ave)</b>	8.86E9	<b>% var</b>	1.41
<b>Cal. temp (K)</b>	2.00	<b>Q<sub>2</sub> (ave)</b>	4.778E12	<b>% var</b>	1.47
<b>Coupling (β)</b>	+	<b>τ (ave)</b>	0.7458	<b>% var</b>	0.65
<b>C<sub>i</sub></b>	1740569 (Pin left)	<b>C<sub>r</sub></b>	220306	<b>C<sub>t</sub></b>	19.6 (Pt bot)

## Cavity Performance Summary

<b>Low field Q<sub>0</sub></b>	1.99E10	<b>@ (MV/m)</b>	5.3	<b>FE onset (MV/m)</b>	--
<b>E<sub>max</sub> (MV/m)</b>	18.1	<b>Q<sub>0</sub> @ E<sub>max</sub></b>	8.88E9	<b>Max rad (mR/hr)</b>	--
<b>Perf. limit</b>	Quench	<b>r<sub>s0</sub> (nΩ)</b>	--	<b>P<sub>loss</sub> (@ E<sub>max</sub>, W)</b>	4.70
<b>P<sub>In</sub> (@ E<sub>max</sub>, W)</b>	4.71	<b>P<sub>ref</sub> (@ E<sub>max</sub>, W)</b>	0.00	<b>P<sub>trans</sub> (@ E<sub>max</sub>, W)</b>	0.01

## Cavity Test Notes

The cavity quenched at 18.8 MV/m. No FE present at any time. Q-drop observed to begin at about 14-15 MV/m. No thermometry on cavity so location of quench (and potential correlation to EDS defect) could not be ascertained.

After warming to 300K, performed a cooldown to 100K, and held there for 8hrs, then cooled back down to 2K and repeated  $Q_0$  vs E test. Result was identical – no performance degradation due to “Q-disease” observed.

Next test shod be with thermometry on equator (and also on location of known EDS defect) to determine if the quench is due to EDS-detected defect. Also should perform 120°C bake to see if Q-drop is improved.

## List of Figures

Figure 1  $Q_0$  vs E @ 2.0K (before and after 100K hold)

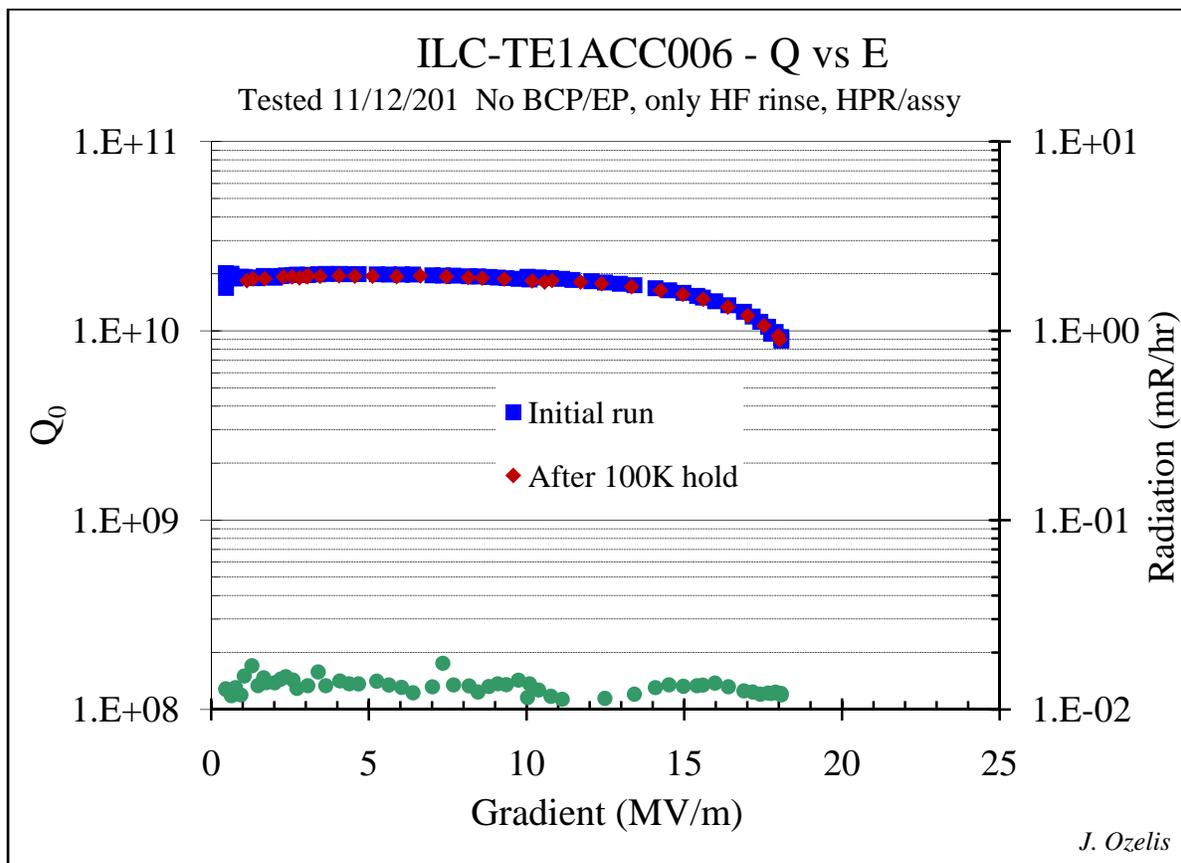


Figure 1.  $Q_0$  vs E @ 2.0K (before and after 100K hold)