Structure Fabrication Witness Coupons
SEM Images and XPS Concentrations

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Witness Coupons - XPS Results

5nm = 50Å = 0.005µm = 0.2µ-inch

% Conc. of Carbon in Top 5 nm

T53VG3MC  H60VG3N  H90VG3N

2/10/03  Kirby/Harvey/Mareija/Le Pimpec
T53VG3MC

After 60 Sec Etch
Visually, Smooth

After Vacuum Bake
Visually, Smooth

Witness Coupons - XPS Results

<table>
<thead>
<tr>
<th>T53VG3MC</th>
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<tbody>
<tr>
<td>60 SEC</td>
<td>Vac Bake</td>
<td>5 SEC</td>
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% Conc. of Carbon in Top 5 nm
H60VG3N

After 5 Sec Etch
Visually, Scratched

After 60 Sec Etch
Visually, Scratched

Witness Coupons - XPS Results

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% Conc. of Carbon in Top 5 nm

2/10/03

Kirby/Harvey/Marcelja/Le Pimpec
H60VG3N

After Vacuum Bake

After Vacuum Bake

Visually, Machined

Visually, Machined

Witness Coupons - XPS Results

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% Conc. of Carbon in Top 5 nm

2/10/03  Kirby Harvey Marcelja Le Pimpec
H90VG3N

Tapered Cells 60 Sec Etch

Other Cells 5 Sec Etch

Visually, Scratched

Visually, Scratched

Witness Coupons - XPS Results

- 60 SEC
- Vac Bake
- 5 SEC

Cu

% Conc. of Carbon in Top 5 nm

T53VG3MC H60VG3N H90VG3N

2/10/03  Kirby Harvey Marcela Le Pimpec
H90VG3N

Baked, Facing Structure

Visually, Smooth

Baked, Facing Structure

Visually, Smooth

Baked, Facing Can Wall

Visually, Machined

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<td>Facing Wall</td>
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</table>

2/10/03

Kirby/Harvey/Marcelja/Le Pimpec
# All Elements On Coupons, Detected By XPS

<table>
<thead>
<tr>
<th>Material</th>
<th>Structure</th>
<th>T53VG3MC</th>
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<tr>
<td><strong>Cu Oxide</strong></td>
<td></td>
<td>60s 24% Bake 30%</td>
<td>60s 32% Bake 45%</td>
<td>Tapered cells 33% Other cells 23%</td>
</tr>
<tr>
<td><strong>Cu Metal</strong></td>
<td></td>
<td>Bake 51/49/53%</td>
<td></td>
<td></td>
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<tr>
<td><strong>O</strong></td>
<td></td>
<td>60s 43% Bake 39%</td>
<td>60s 32% Bake 38%</td>
<td>Tapered Cells 50% Other cells 39% Bake 26/27/20%</td>
</tr>
<tr>
<td><strong>C</strong></td>
<td></td>
<td>60s 29% Bake 30%</td>
<td>60s 17% Bake 16%</td>
<td>Tapered cells 13% Other cells 34% Bake 22/24/27%</td>
</tr>
<tr>
<td><strong>Cl</strong></td>
<td></td>
<td>60s 1% Bake 0%</td>
<td>60s 1% Bake 0%</td>
<td>Tapered Cells 0% Other Cells 1% Bake 0%</td>
</tr>
<tr>
<td><strong>P</strong></td>
<td></td>
<td>60s 3.5% Bake 0%</td>
<td>60s 5% Bake 0%</td>
<td>Tapered Cells 5% Other Cells 3% Bake 0%</td>
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</tbody>
</table>
Conclusions

• Coupon finishes are not identical.
• Coupons will be etched for 60 sec and dry H2-fired, prior to use.
• Fermilab coupons will be treated the same as SLAC’s.