New Immersion Tin Process
PRESA® RMK-30
Tin Whisker Issue
Preventing Tin Whisker

It is well-known that whisker is easily generated on tin coating. Many studies about tin whisker were done, and it is generally understood that diffusion layer (Cu₆Sn₅) between copper and tin layers generates internal compressive stress and influences tin whisker growth. When the other metal is included within tin coating, also it is well-known to prevent tin whisker growth. Especially silver is most effective for whisker.
Tin Whisker Evaluation

Test Method
- Room temperature / 30 deg.C
- Office environment / 60 % RH
- Evaluating period / 3000 hours (125 days, 4 months)
- Substrate / PWB with PTH
- Inspection / inner wall of PTH by optical scope or SEM

Result

<table>
<thead>
<tr>
<th></th>
<th>1w.</th>
<th>2w.</th>
<th>1mo.</th>
<th>2mo.</th>
<th>3mo.</th>
<th>4mo.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RMK-20 (w/o Ag)</td>
<td>OK</td>
<td></td>
<td></td>
<td>NG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RMK-30 (with Ag)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>OK</td>
<td></td>
</tr>
</tbody>
</table>

Note) w./week, mo./month, OK/no whisker, NG/one or more tin filament
Whisker test / 3000hrs (4 months)

RMK-20 (W/O Ag)

RMK-30 (with Ag)
Whisker test / 4500hrs (6 months)

RMK-20
(W/O Ag)

RMK-30
(with Ag)
Conclusion

- When silver was co-deposited with tin, the alloy was effective in preventing tin whisker growth. Tin coating with silver provided smooth surface without typical tin crystal. (See photographs in page-2.)

- No tin whisker was found on RMK-30 coating (including silver) after 6 months aging.

- When Ag content in tin film is more than 0.5%, tin whisker isn’t found on RMK-30 film.