SOLECON LABORATORIES INCORPORATED

DIRECT FROM DAVE

Solecon Labs has had many great years in Silicon Valley and we look forward to many more. However, the growth of the valley has inspired us to find additional elbow room beyond San Jose. On July 11, 2001 we broke ground for a new laboratory in Reno, Nevada, a quick hop over the Sierra Mountains on I-80.

Our intention is to service most of our non-Silicon Valley accounts from there. Our office on Paragon Drive in San Jose will continue to operate for the foreseeable future to handle the local work. Basically no one should notice a difference in our service. Those that have been shipping materials to us will still be shipping. Those that have utilized the San Jose location will continue to have full-service as usual.

A bit of insight on the decision: we realized a while back that most of our business was coming in by overnight courier. While this could not have been said 10 years ago, our location no longer depended on the proximity of other Silicon Valley-based businesses. Additionally, almost anywhere in the country could offer us housing for far less than what we find here. And easier commutes. And maybe a labor market with non-zero unemployment rate.

We took polls and surveyed possible locations, and in the end decided that Reno offered unique benefits for our particular situation. Please read the newsletter and get a feel for what is happening with our company. Plan to visit us at our new headquarters in Reno beginning January 2002. It is amazing how much there is there beyond the casinos.

Dave Dickey founded Solecon Laboratories in 1975. His research helped to create SRA standards for the National Bureau of Standards (now the National Institute of Standards and Technology).

NEW YEAR, NEW BEGINNINGS, NEW BUILDING

The new laboratory/office facility will be in the South Meadows Industrial Park, about 5 miles south of the Reno airport. We plan to move in at the beginning of 2002.

A TALE OF TWO CITIES:
Your guide to the changes at Solecon

Those of our clients who are based in Silicon Valley will experience no disruption in their orders.

Those of our clients who are outside of Silicon Valley will receive a new address to ship materials.

The new headquarters is only a two-hour drive from Sacramento, without the traffic of the Bay Area. The area is a natural hub for shipping companies such as UPS, as I-80 intersects with Hwy. 395 only one mile north of the airport.

Silicon Valley clients who would like to use the shipping method are welcome to do so. Twelve of our sixteen employees will be transferring to Reno.

We stay connected with the San Jose office via a virtual private network, ensuring continuous electronic contact. Collaborations between our engineers will continue as they do now, to produce the highest quality reports possible.

Nevada's tax structure is conducive to reducing overhead costs. The state has no personal income tax, no corporate income tax, no unitary tax and no inventory tax. We believe it will contribute to our strength and stability in the long run.. We look forward to these benefits and anticipate new opportunities to best serve our customers.

TO SILICON CHIP MAKERS & USERS:

If the impurity doping concentration and distribution in silicon in any way affects your activity, then some amount of Spreading Resistance Analysis can be helpful.

In some cases, only a few profiles a year are needed. In other cases, companies have found it desirable to use the technique rather extensively. Whatever your needs may be in obtaining Spreading Resistance Analysis, Solecon Labs can probably help.

For instance:

- *We will analyze your wafers with state of the art technique and fast turnaround.*
- *If there have concerns about the results of your data, we are available to do in-depth consultation. Our 25+ years of experience lends to a wide capacity of interpretation & analysis for your business.*
- *If you have your own spreading resistance probe, we are available for 3rd party correlation.*

Solecon Labs developed the data reduction method and associated software package which is to this day considered the best in the industry. We welcome calls to talk about any questions regarding Spreading Resistance Analysis, it is our business!

"Problems are messages."
-Shekti Gawain

PROFILING NORM REVIEWED AT CONFERENCE

Solecon owner Dave Dickey presented a paper entitled "Developments in Ultrashallow SRA" at the 6th biannual Ultra-Shallow Profiling Conference, held in Napa, CA. April 22-26, 2001. Until this year, the conference has been held at Research Triangle Park in North Carolina.

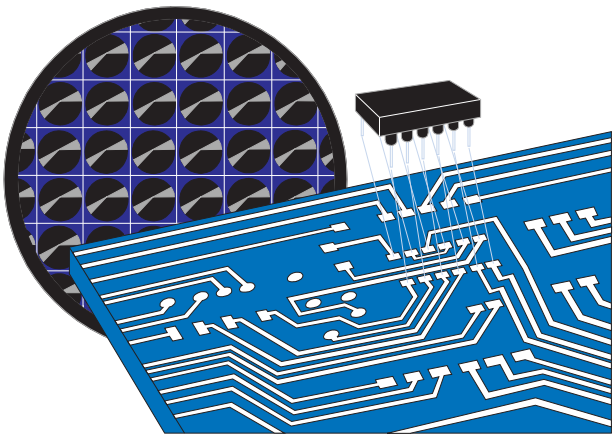
As at past conferences, there was heavy emphasis on attempts to meet requirements of the International Technology Roadmap for Semiconductors. This included numerous SIMS profiles, dimensional profiling with AFM- based equipment and descriptions of problems facing those dealing with 100nm devices.

The paper offered by Dr. Dickey discussed implications of using a one-dimensional approach in profiling.

"The data reduction process in SRA is nearly always carried out using a one-dimensional solution to Laplace's equation, but the reality is that it is a two-dimensional problem because of the non-zero bevel angle." according to Dickey.

He showed that 10-20% errors can arise from the bevel angle related effects, and provided a mathematical solution to the problem.

If you want a reprint of the paper, just call and ask for it. It is scheduled to be published next year in the Journal of Vacuum Science Technology.



FYI: UNDERSTANDING THE USE OF BEVELS

Spreading resistance profiling is nearly always done on a beveled sample. This creates some constraints which should be acknowledged so that the SRA user can understand what is or is not possible.

Basically, the bevel functions to expose material below the surface making it possible for our technicians to probe the sample. Using a non-vertical angle effectively spreads out the depth range and gives us an improvement in depth resolution nominally equal to the cosecant of the bevel angle. There is a constraint on how shallow of an angle we can use on the prepared samples, and it is set by the size of the pattern being probed.

If the angle is too shallow, we will step over the boundary of the pattern before we get to the depth of interest. Our depth of interest may be more involved than what our sample providers anticipate, because we want to probe deep enough to reach a junction or a uniformly doped substrate in order for our data reduction computations to converge. The overall point is that resolution is limited by pattern size.

There are also some limits to what can be done on blank test wafers. It is difficult to produce a scratch-free bevel longer than about one or two millimeters, so to get through a deep structure with high resolution we must use steeper angles and possibly smaller horizontal steps between data points. Steps smaller than the contact diameter (nominally two to five microns) are not feasible so again there is an ultimate limit on resolution. Finally, at very shallow bevel angles we run into limitations with rounding at the beveled edge. Even our best beveling techniques result in rounding to a depth of perhaps 50 Å. This means that to characterize modern super-shallow layers we will likely require approximately 100 Å of oxide on the surface to move the rounded region away from the silicon surface.

Also, something to consider when requesting a profile on the back surface of a wafer-unless the back is polished, any attempt to characterize a thin doped layer will result in unacceptable noise. A backside implant for example will produce a conformal layer on the wafer. That means that the junction under the implant will not lie in a geometric plane, but will reflect the surface topography. *When we grind a bevel, the surface we generate will be a geometric plane, and it will intersect the junction not in a straight line but in a very irregular way.* As we probe "down the bevel" we will not get incrementally deeper below the local surface, so the data turns out very noisy and even the junction depth will be portrayed over a fuzzy range. The conclusion is that it usually not feasible to profile under a lapped/etched surface.

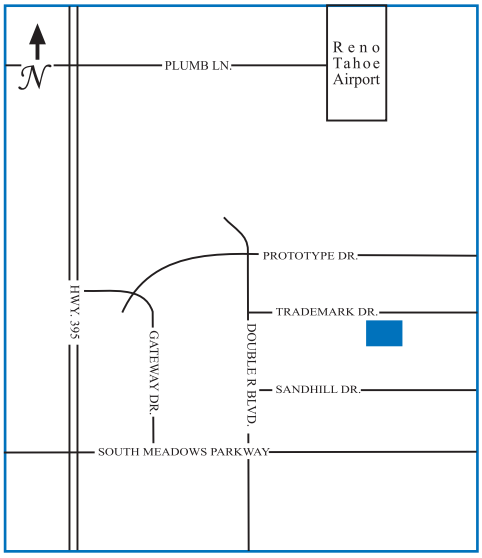
STAFF MILESTONES

Events that shape the lives of the people who make up the crew at Solecon Labs.

NATASHA LEAVES-

Natasha Robinson has left Solecon Labs after eight years serving as the capable core of our customer service/accounts receivable/shipping function. She has uprooted to Tracy, Cal. where her husband recently transferred. Hers was the voice you would most often hear when calling the office, or the one you would most likely hear to discuss details about your purchase orders, etc. Although we are happy she has made a smooth transition, we miss her already.

SOLECON*RENO*



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LOCATION OPENS JAN. 2002

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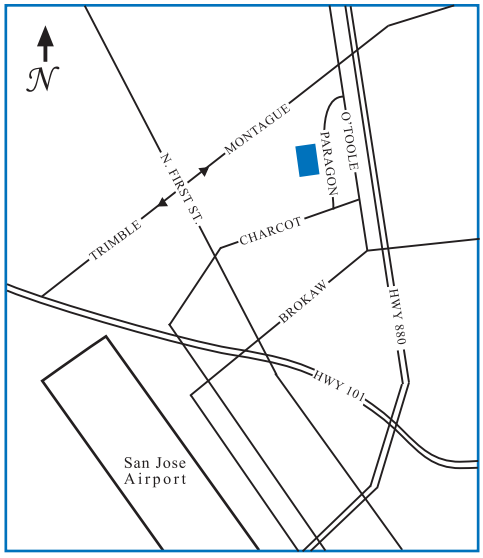
FOR YOUR NEXT ANALYSIS

SOLECON*SAN JOSE*



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