



## STAFF HIGHLIGHTS

### Director for Quality Assurance brings experience and expertise to Solecon.

Roger Brennan, a 17-year veteran of Solecon Labs, rejoined us in November of 2004 as our Applications Director. In 1997 Roger left Solecon Labs to pursue other endeavors that included eddy current metrology, MEMS, and quality control. He also received his ASQ quality-engineering certificate.

For 12 years Roger worked as the manager of Solecon Labs and later became the president. We feel fortunate to have someone with his experience rejoin our team.

Roger Brennan received his BS in Chemistry from Marshall University, in Huntington, W. Va in 1963. After working as a chemist for two years, he joined the Texas Instruments MOS development program in Dallas. For the next twelve years he worked in the area of masking and diffusion for a variety of companies as a process engineer. Roger was also an instructor of Semiconductor Processing at Foothill College in Los Altos, CA

In addition Roger is also part of a team promoting Spreading Resistance Analysis via seminars and tradeshows. The seminars are designed to be a convenience to our customers, provided free of charge to heighten the awareness about how SRA can be used to characterize and troubleshoot dopant vs depth profiles. Call Sheila Loftis at 775-853-5900 for details.

## WONDERING IF SRA WILL WORK FOR YOUR SAMPLES

Overall, this is a material question. Effective use of Spreading Resistance Analysis is primarily to profile and measure silicon. Solecon Laboratories has NIST traceable silicon calibration standards that enable us to convert the measured resistances obtained by a spreading resistance probe into resistivities and we have good mobility data to convert resistivity to carrier concentration.

Don't rule out SRA for other materials however. SRA has also been used on a variety of other materials with some successes and some failures. For example, SRA does not work well with gallium arsenide. The problem is that contact with the material normally shows a barrier resistance. This pushes the entire range of GaAs resistivities into the highest range of measurable resistance. In some cases even beyond our instrument's range. This happens with most wide band gap semiconductors.

Narrow band semiconductors such as germanium can be tested with SRA. We have been profiling germanium for quite a number of years and have managed to generate a meager set of calibration standards, which allow us to generate resistivity and concentration data. If you have a SiGe alloy unfortunately we don't have SiGe calibration standards.

Indium phosphide samples have been tested lately with a reasonable degree of success. The changes in concentration have a corresponding shift in the measured resistance data. Due to the variety of indium compounds, resistivities are still unknown.

We are unable to profile hard materials such as sapphire and silicon carbide as they wear out the probe tips faster than we can calibrate.

## DID YOU EVER WONDER WHY?

### **The color blue is used for baby boys?**

Centuries ago, it was commonly believed that satanic spirits hovered about nurseries waiting for a chance to enter the bodies of young children. It was also believed that these evil spirits could be repelled by the color blue, the color of the heavens. Even today, in the Mideast, certain Arabs still paint their doorways blue to keep away evil demons. Since it was felt to be of crucial importance to protect young males, it became the custom to dress them in blue to ward off any evil spirits that might be lurking about. Much later, so that baby girls would also have a color, it was decided to assign to them pink, the color of the rose.

### **A woman who pays her own way on a date is said to be “going Dutch”?**

This expression originated in the seventeenth century when the Dutch and English were both business and military rivals. During that period the English held the Dutch in very low esteem, and this was reflected in many of their expressions. A “Dutch bargain” was a one-sided deal, “Dutch courage” was courage gotten from a bottle, and a “Dutch nightingale” was a frog. So, if a man asked a woman out and then let her pay her own way, the woman was said to be receiving a “Dutch treat,” and the couple was said to be “going Dutch.”

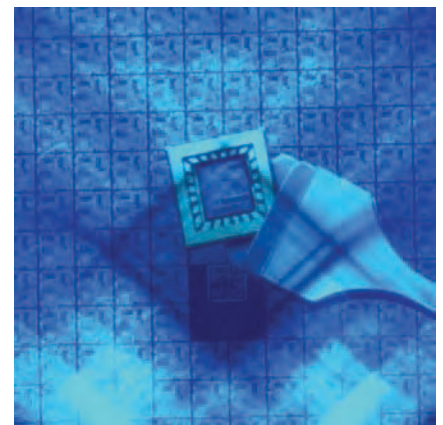
### **So many whales beach themselves?**

Whales navigate using sound waves in much the same way as submarines do. They send out sound signals of a certain frequency and then measure how long it takes the signals to bounce off of the ocean floor and return. The longer it takes, the deeper the water. By this means whales are usually able to keep out of shallow water. Sometimes, however especially around shallow sandy bottoms the whale’s sound signals are partly absorbed by sand and then bounced back and fourth between the shallow bottom and the surface of the water. This delays the time it takes for the signal to get back to the whale, making the whale think that it is approaching deep water. The whale proceeds ahead and, to its surprise, finds itself beached in shallow water.

## 10 Business Success Principles That Still Apply In The Internet Age

1. Customers matter.
2. One day, revenue needs to exceed costs.
3. Trust is the basis of business relationships.
4. There are only 24 hours in a day.
5. There will always be value in brands.
6. There will always be competition.
7. People are self-interested. So are companies.
8. People need a powerful incentive to change their behavior.
9. Sex sells.
10. No one really wants a relationship with a telephone company.

*From Business 2.0 magazine*



## IN THE PURSUIT OF THE ULTRA-SHALLOW PROFILES

We are continually working to obtain ever-shallower bevel angles and low penetrating probes. From the SRP point of view these are the two most essential conditions required for ultra-shallow profiles. However the process steps are just as important for us to obtain meaningful data. You may hear us say, "If your samples are well behaved"? Well, our results depend a lot on how well your wafers have been annealed. We are unable to provide meaningful results on samples that haven't been annealed or inadequately annealed. Issues such as "anticipation of the bevel edge" and "carrier spilling" also plague us in our pursuit of the elusive "ultra-shallow" profile. For a more in depth, technical discussion of these issues please call and talk to Dan Dickey our expert in this matter.

As to our progress to date we are able to obtain bevel angles of .001 radian, but they are time consuming. These shallow bevels take considerably more time to prepare than standard .005 radian and steeper bevels. I make mention of this to forewarn you that a job with a half a dozen or so test wafers may take a full day or more to complete instead of a few hours or so. Data reduction software is being developed to address issues such as "anticipation of the bevel edge" and "carrier spilling". We are currently designing our own spreading resistance probe with an emphasis on advanced probe. Ultra-shallow profiles have become a mission with us and you can rest assured that we are going to continue our pursuit to improve our capabilities.

*"Technology is the instrumental ordering of human experience within a logic of efficient means"*

*-Daniel Bell, Author  
The Winding Passage*

### *In Memory*

With great regret and concern, we announce to our customers the death of MICHAEL POULAKOS. Those of you who had the pleasure of working with Mike over the past 15 years will know that he is greatly missed. Mike was an asset to the Solecon team, dispensing technical advice, friendliness and humor. Before joining Solecon Labs, Mike was a process engineer at various semiconductor companies and a customer of Solecon Labs.

## IN THE PURSUIT OF ULTRA-TEMPTING DISHES

### Filled Cookies

These cookies are perfect for any occasion, with a glass of frosty milk, an afternoon snack or with a cup of your favorite coffee.

#### Ingredients

½ cup shortening  
1 cup sugar  
2 eggs  
2 tablespoons cream  
1 teaspoon vanilla  
2 ½ cups sifted flour  
¼ tablespoons baking soda  
½ teaspoon salt

#### Filling

½ cup each raisins, figs, dates cut very fine  
½ cup sugar  
½ cup water  
2 tablespoons lemon juice

In a mixing bowl mix thoroughly shortening, sugar and eggs. Stir in cream, vanilla sifted flour, baking soda and salt.  
Chill for one hour.

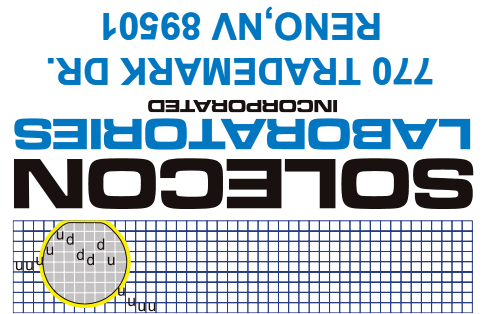
#### Filling Directions

In a small saucepan mix all filling ingredients and cook slowly till thickened about 10 minutes.

Bake cookies in a 400 degree F. oven about 8-10 minutes or until edges are firm and bottoms are lightly browned. Transfer cookies immediately to a wire rack; cool.  
Makes about 3 dozen.

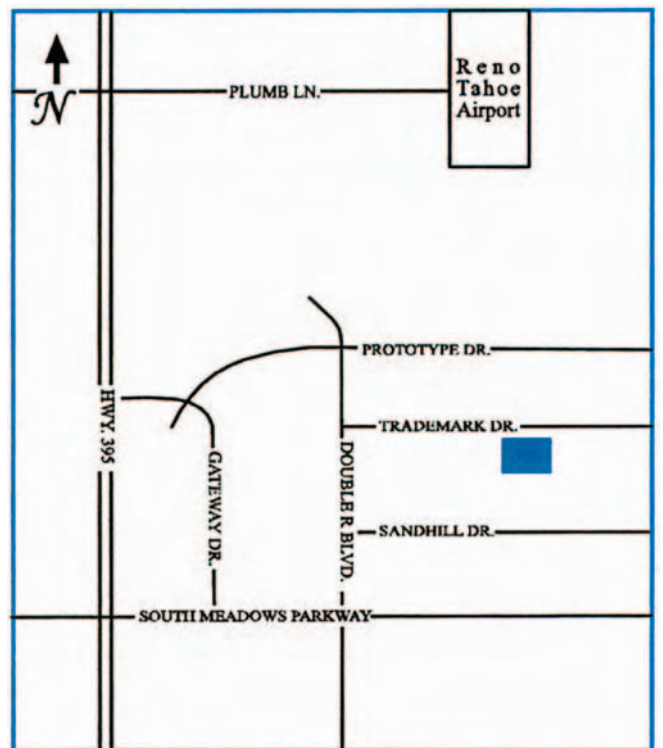
**Enjoy!**

Submitted by Bobbi Dickey



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**November 8-9-2005**  
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Santa Clara Convention Center



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