

NineSigma Conference on Open Innovation Presents:

# The Business of Providing Solutions

John Moore, Founder

Daetec, LLC

March 25, 2013

*Diversified Applications  
Engineering Technologies*



# Agenda

1. Problem Statement
2. Environment of Solutions
3. Daetec's Solutions Model
4. Providing Solutions
5. Previous Successes
6. Summary

# 1. Problem Statement

How do You Gain a New Market,  
Customer, or Technology?

- Increase investment
- New product development
- New tool design
- New process design
- Modification or ancillary
- Bundling

All of these cost time & money



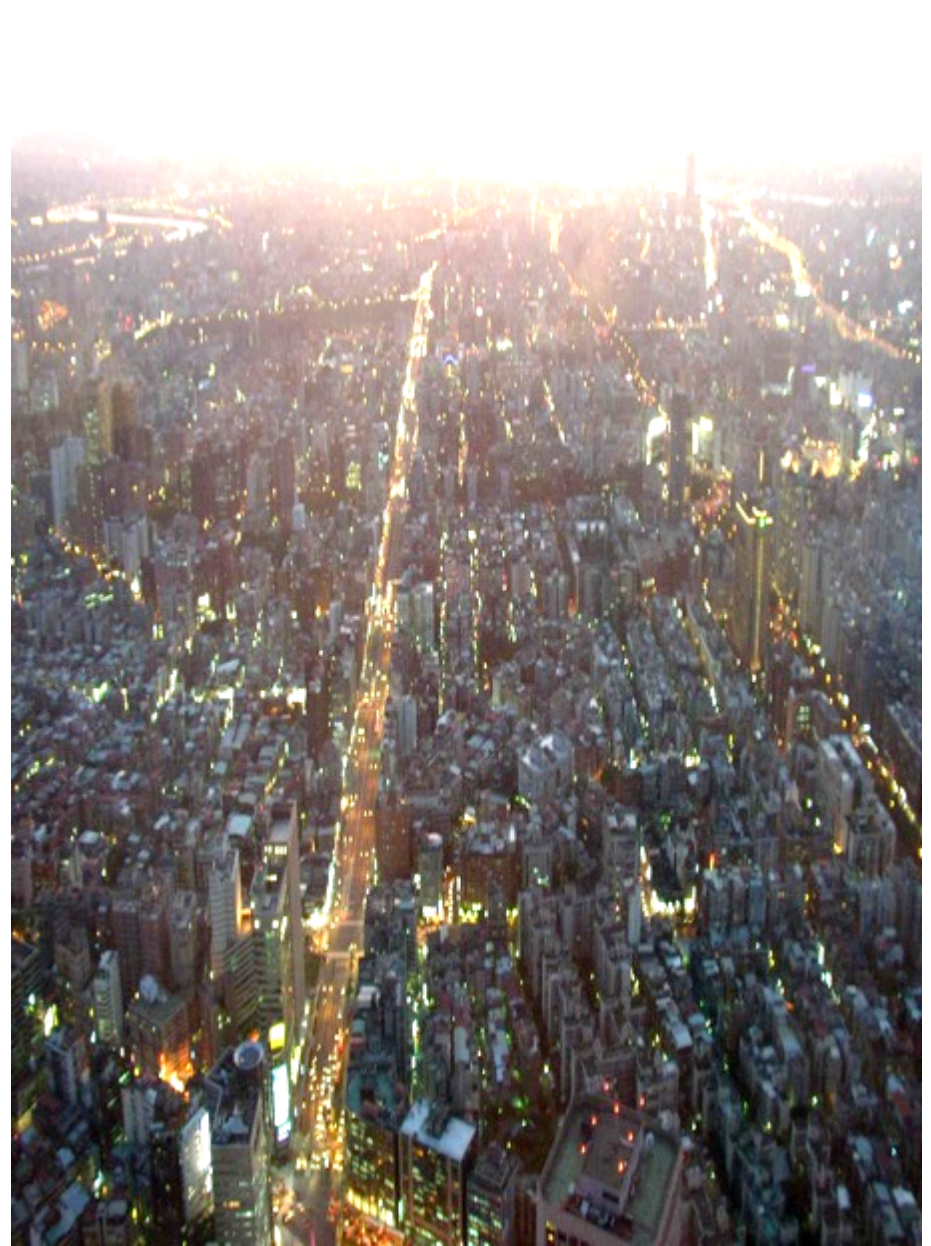
# What are the Barriers?

- Internal
  - Ability to change
  - Responsiveness
  - Experience
  - Resources
  - Staff
  - Cost
  - Global presence



# Do External Barriers Exist?

- Market knowledge
- Customer access
- Local presence
- Business fit
- Competition



## 2. Environment of Solutions

- Companies are more interdependent
- Open innovation promotes solution searching
- Internet is a connection tool
- Cross-pollination between markets is common



# Solution Provider

## *A Customized Approach*

Action	Risk/Benefit
Build Infrastructure	Diluting resources/leadership is critical, model is a start-up
JV	Limited IP/share resources
Purchase	Disruptive tech/capture a market or customer
Solution provider	Limited risk/know-how, collaboration, tech transfer, IP, customer-driven

## Safety & Protection

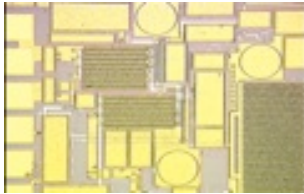
### Automotive



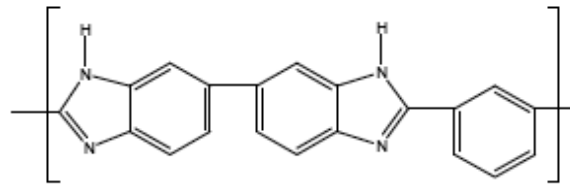
### Parts Manufacturing



## Materials & Processing



### Electronics & Semiconductor

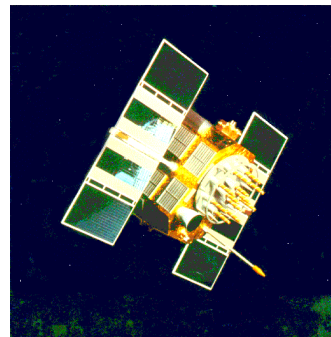


### for Multiple Applications

### Aviation



### Composites



### Aerospace



### Metal Working



# 3. DAETEC's Solution Model Bridge to Success

- **Suppliers**
- **Wafer Fabs**
- **Manufacturers**



- **End-Users**
- **Assemblers**
- **Consumers**

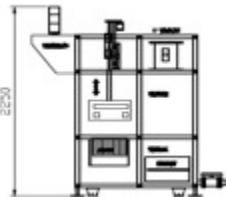
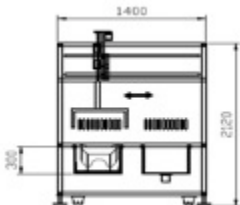
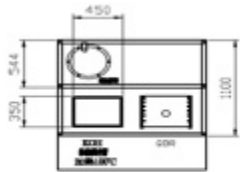
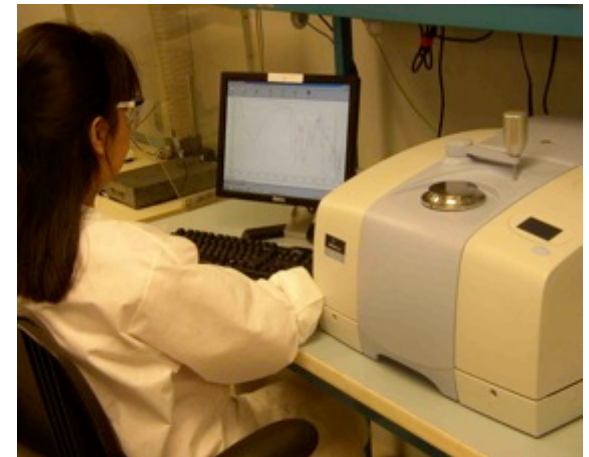
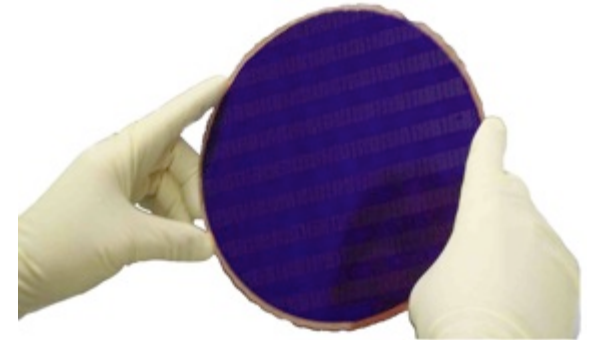
- **New Products**
- **Solutions**
- **New Markets**
- **Ancillaries**
- **New Processes**

# Daetec, LLC (USA)

## Technology Development Company



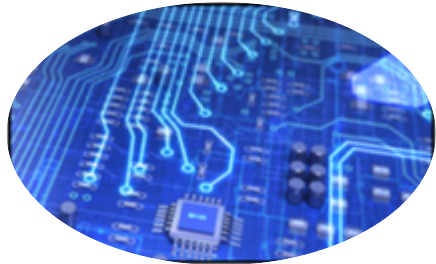
- Providing solutions:**
- 1. Apps engineering**
  - 2. Process development**
  - 3. Tool and fixturing**
  - 4. Tech transfer**



**Join our team to  
enable your success**



# Daetec's Creative Environment



## Silicon Valley

- HP
- INTEL
- Google
- Ebay



## Aviation & Aerospace

- JPL
- Boeing
- Northrop



## Los Angeles

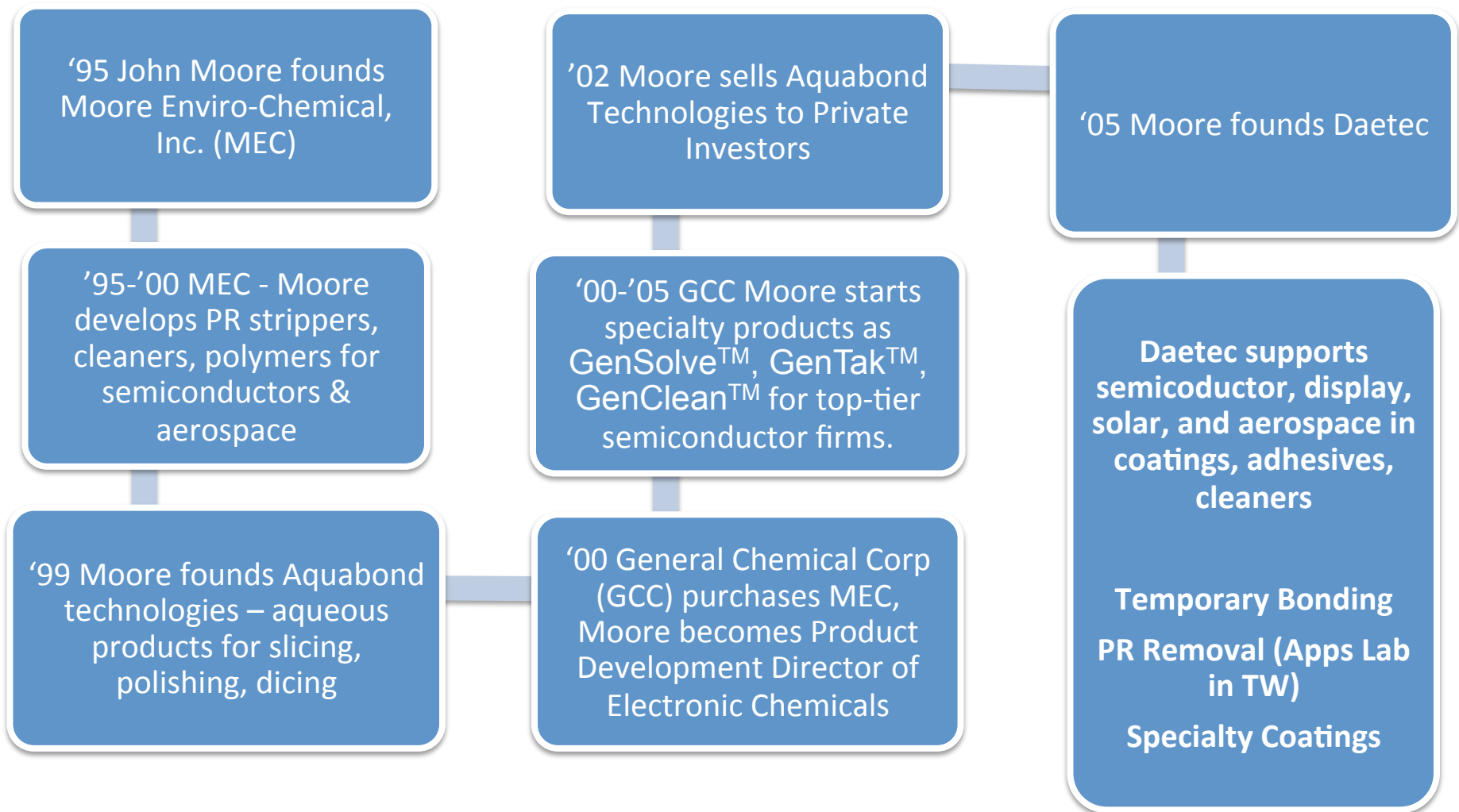
- Film
- Entertainment
- USC/UCLA
- Leisure



# Daetec's Founding Member

- John Moore, >25yrs in product development
- Daetec is Moore's 3<sup>rd</sup> company, prior 2 sold
- Manufacturing support >10yrs
- Global clients – USA, EU, Asia
- Commercialized products to INTEL, Motorola, TSMC in semiconductor & currently working with several fabs in display
- >25 patents, >100 publications

# History



# Daetec Applications Lab - TW



Process tool  
design, testing,  
build

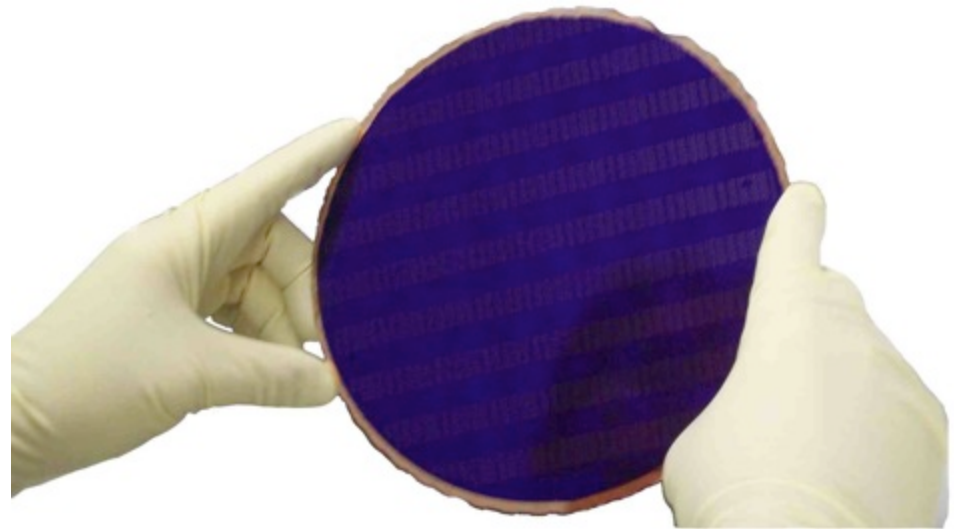
Semiconductor  
bumping & display

PR removal  
Temporary bonding

# Markets - Microelectronics

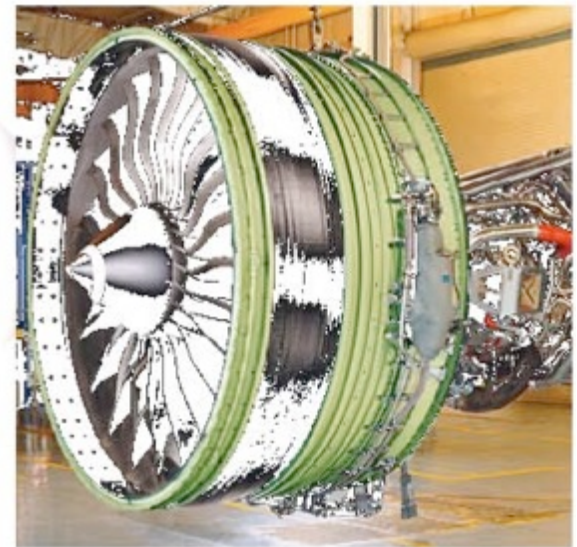


- **Semiconductor & Display**
- **Cleans**
- **Coatings**
- **Etching, surface treatment**
- **Corrosion protection**



# Markets – Aerospace/Aviation

- Polymer sealants & coatings
- Cleaners
- Composites





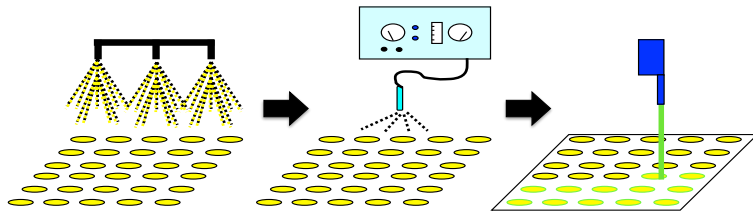
# Markets - Industrial



- Automotive
- Construction, roofing, coating
- Metal working, machining
- EHS compliant coatings & cleans

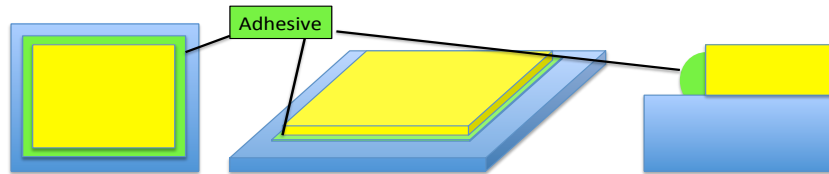
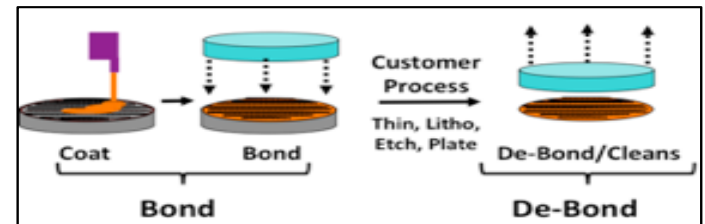


# Temporary Bonding



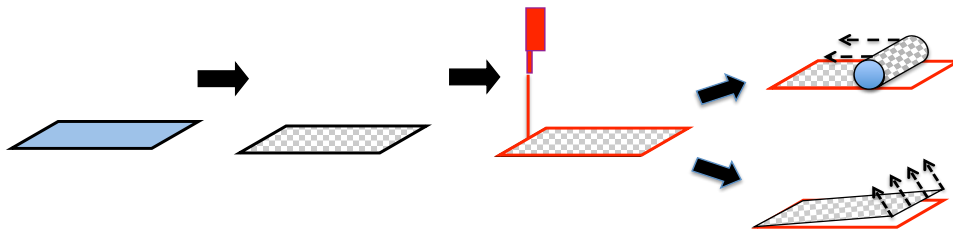
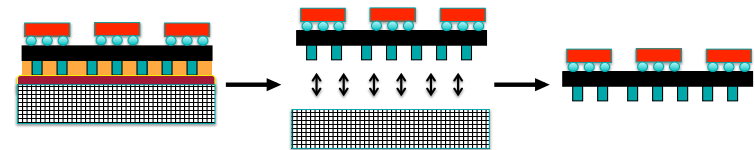
**Glass & Ceramic Pieces**

**Wafers**



**Panels & displays**

**Components**



**Films & coatings**

# Understanding Materials

Pos. Resist Application  
Spin-on, Novolak, Acrylic

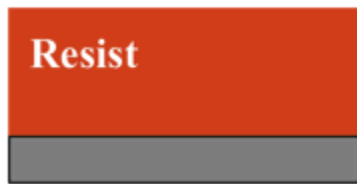
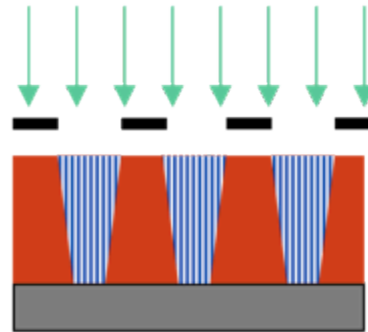
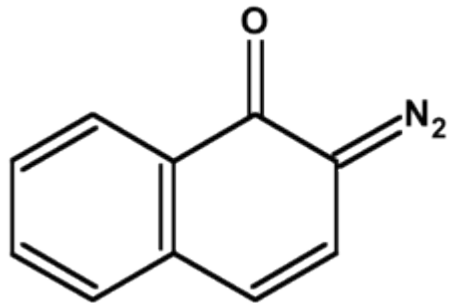
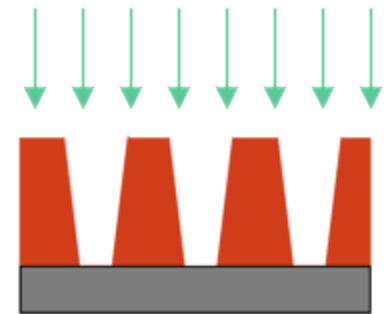


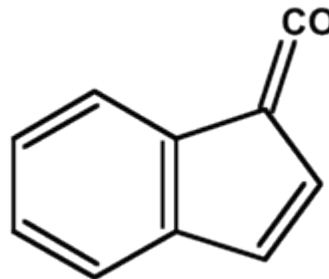
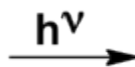
Image through Pattern  
Convert DNQ to Acid



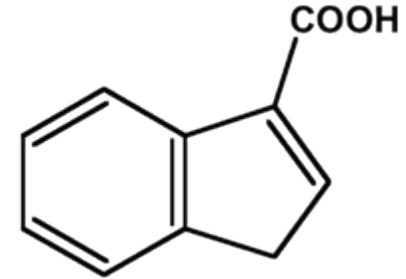
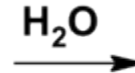
Development  
Aqueous Alkali  
Pos. Pattern & Slope



DNQ  
Non-polar



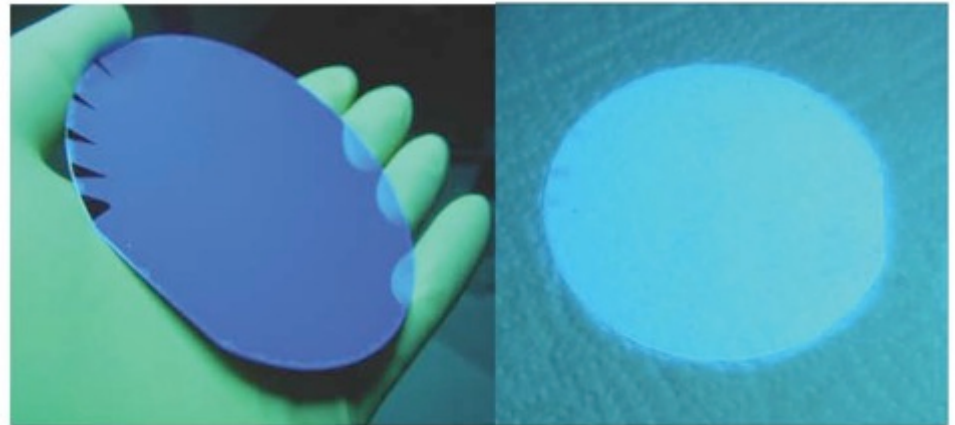
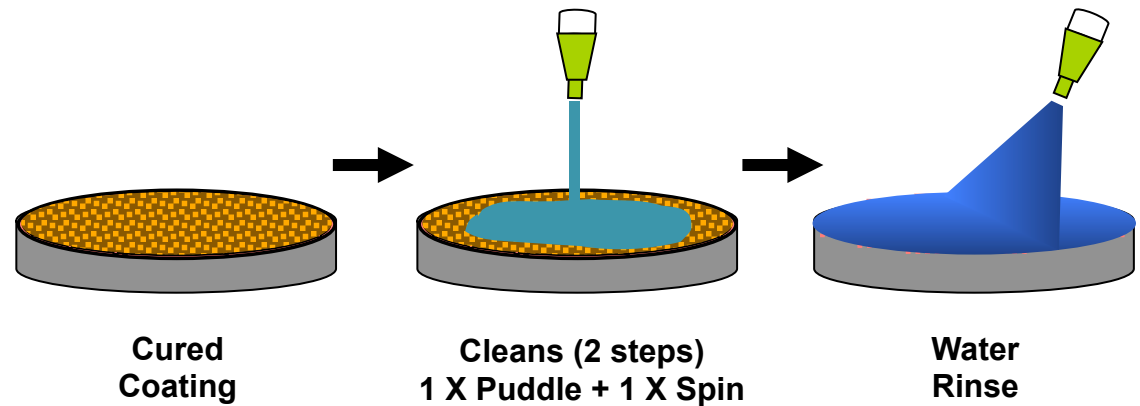
Ketene  
Polar



Acid  
Polar

# Coating Technologies

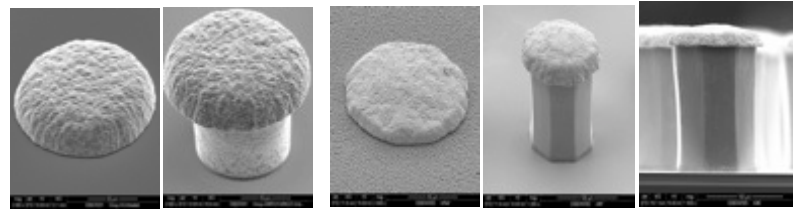
- Spin-Coating
- Spray Coating
- Slit/Brush/Roll
- Films
- Molding
- Photo initiated
- Thermal/Electrical Conductive
- Temporary/Permanent



# Cleans & Surface Treatment

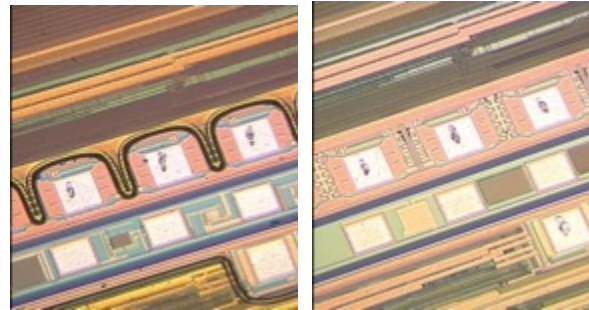
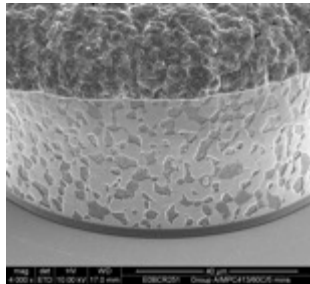


Process Development

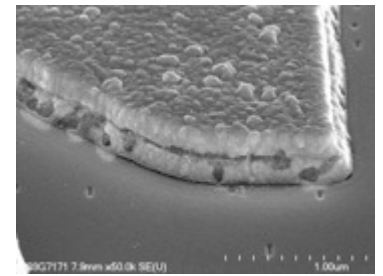


Thick PR – Large Features

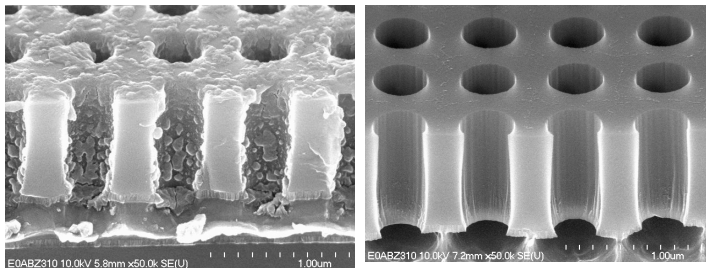
Dissimilar Interfaces



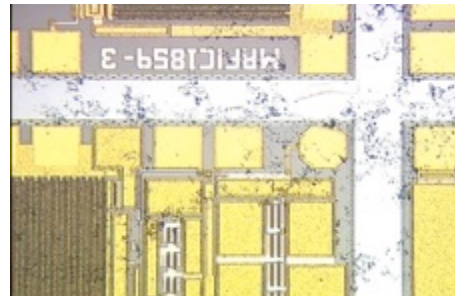
Dielectrics



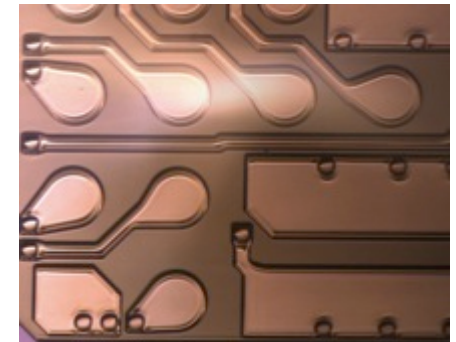
Corrosion



PR Etch Residue



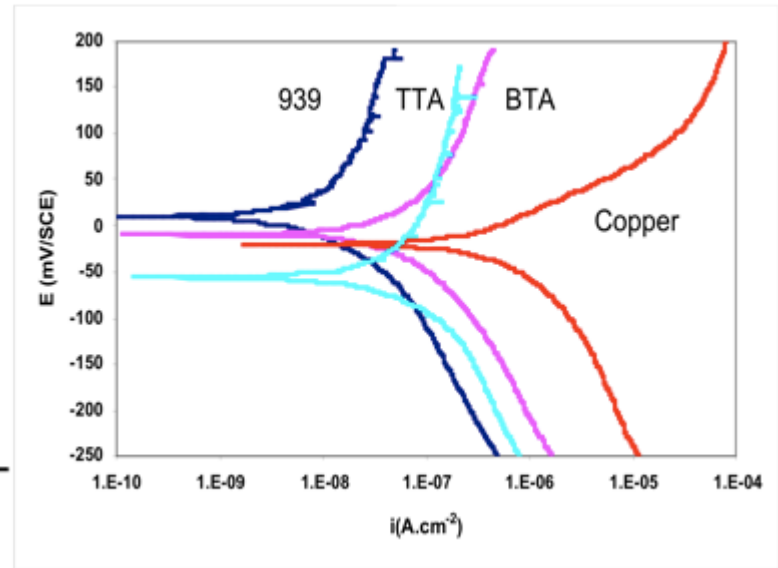
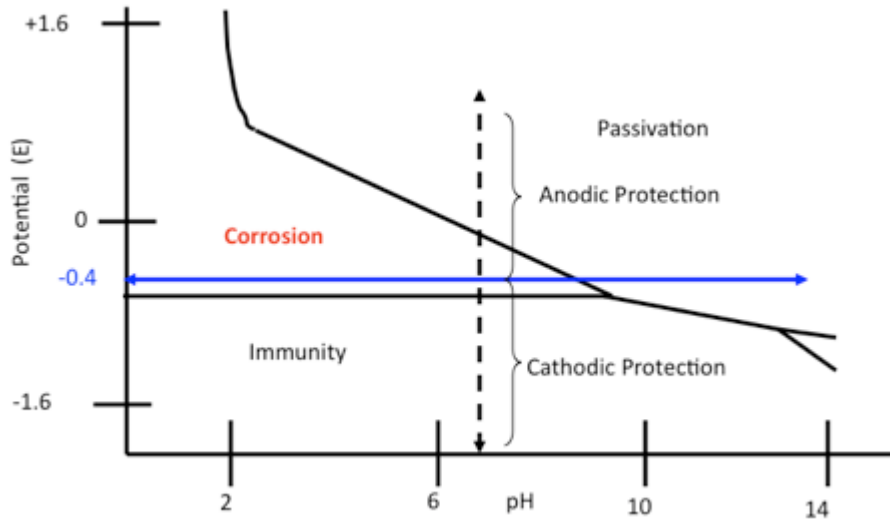
Particles



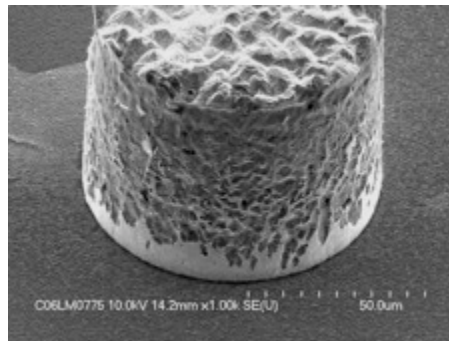
Metal Etch

# Corrosion Control

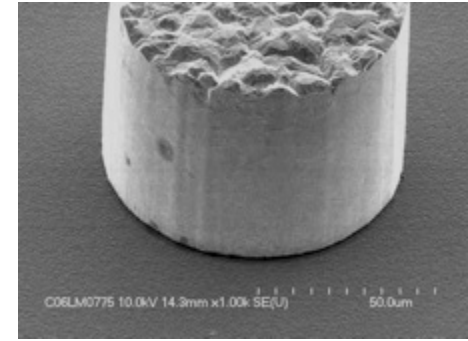
## Pourbaix Diagrams & Tafel Plots



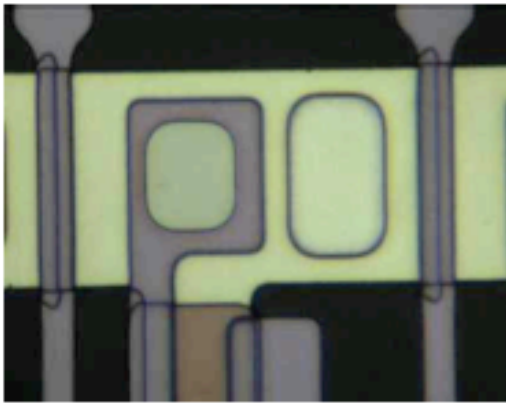
**Feature Corrosion**



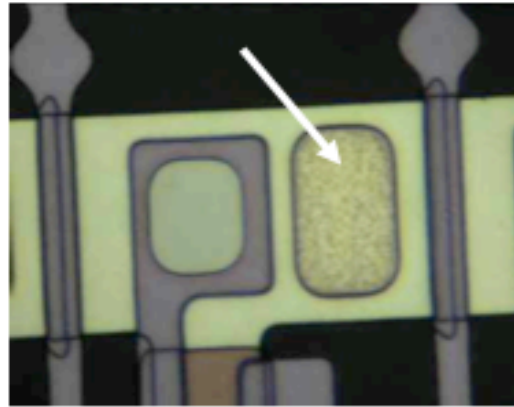
**Inhibitor Added**



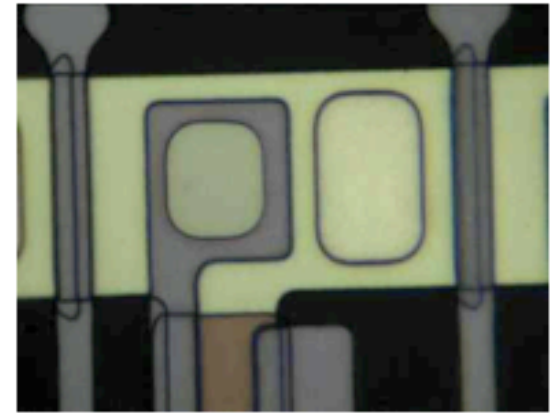
# Cleaning – Panels (Solar/FPD)



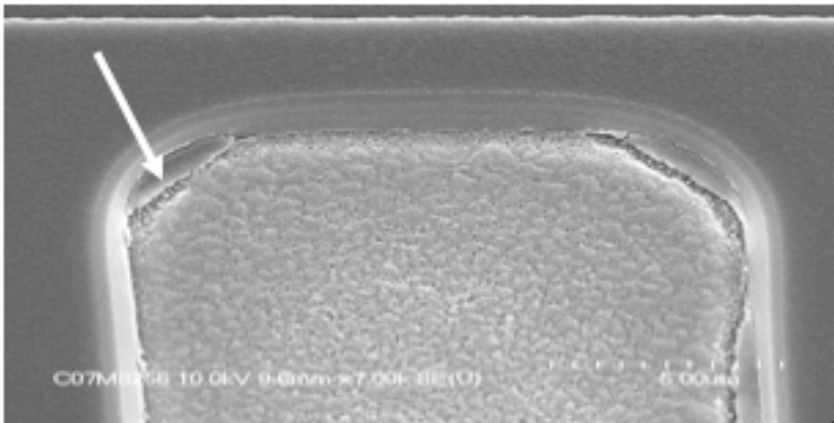
**H<sub>2</sub>O Rinse - IPA**



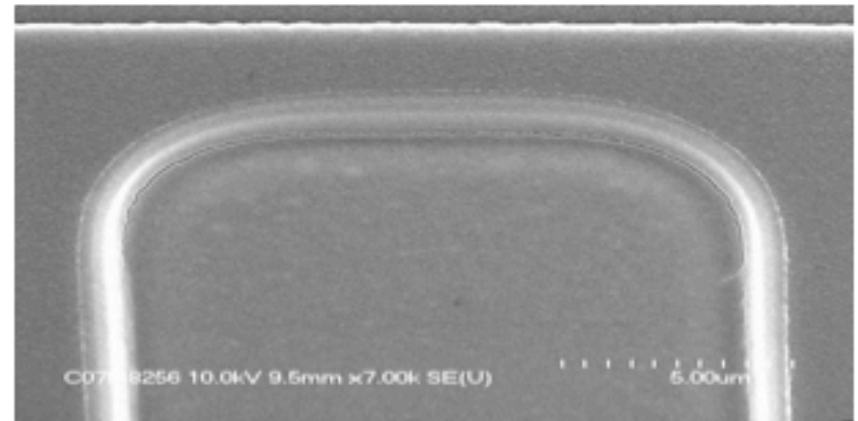
**H<sub>2</sub>O Rinse - Ref**



**H<sub>2</sub>O Rinse - Inhibitor**



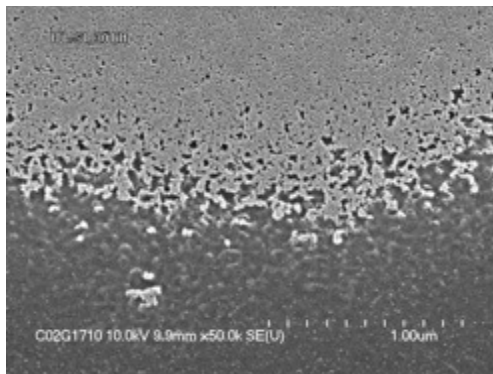
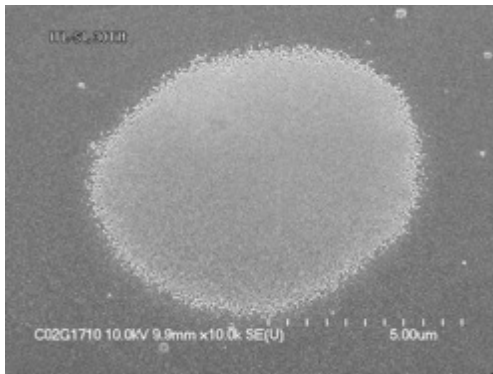
**H<sub>2</sub>O Rinse**



**H<sub>2</sub>O Rinse + Inhibitor**

# Etchants & Surface Finishing

## Irregular Etch

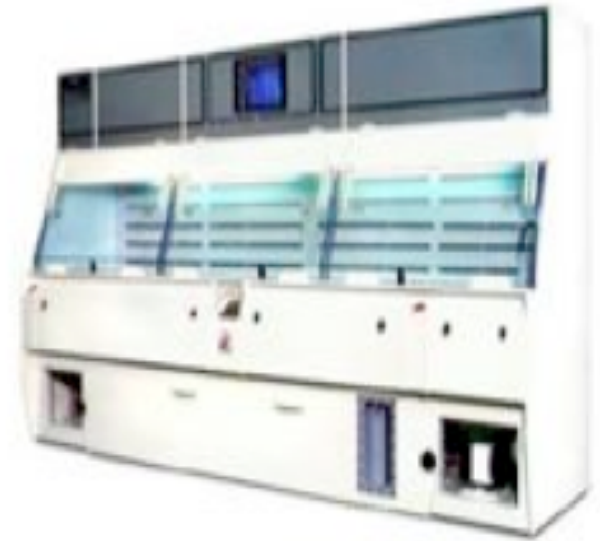
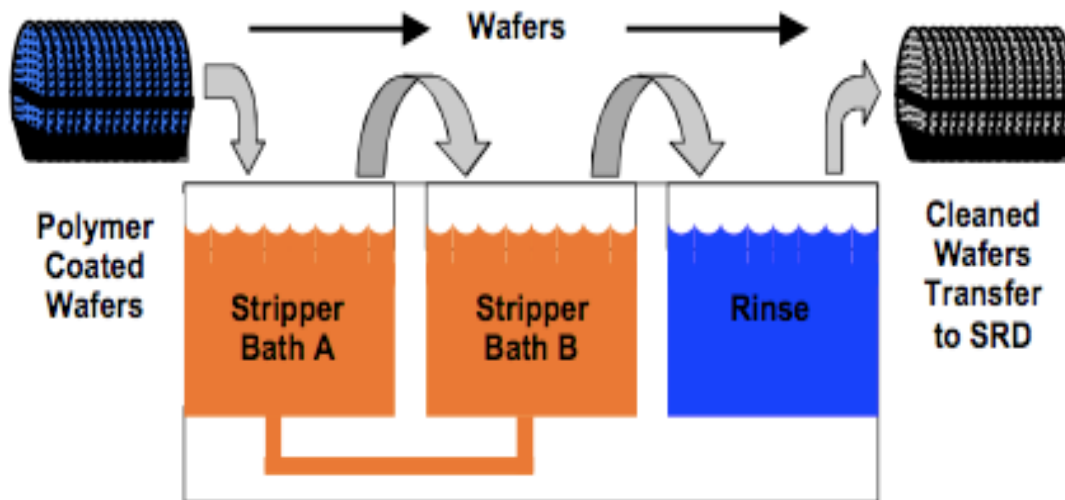


- Au Etch (aqueous & solvent)
- Buffered Oxide Etch (BOE)
- Chrome Etch
- Si Etch (acid & base)
- Mixed Acid Etch (MAE)
- Phos Acid Etch (PAE)
- Surfactanated Etchants



# Process Improvement

## *Isolating Factors in the Process Step*



Temperature control, limited filtration, limited agitation  
Lower cost vs. batch or single wafer.

# EHS Compliant Development

- Solvents Replaced with Aqueous agents
- *Green* Coatings
- *Green* Cleaners
- Reduced Energy Use
- Eliminate Toxic or Regulated Items
- Eliminate Haz Waste



# Toll Mftr Facilities

- R&D in Camarillo, CA
- Access to toll mftg at multiple locations



# Daetec's Customers

- Daetec has developed products, patents, and papers, with a wide number of leaders in many industries.



SHARP.



EASTMAN



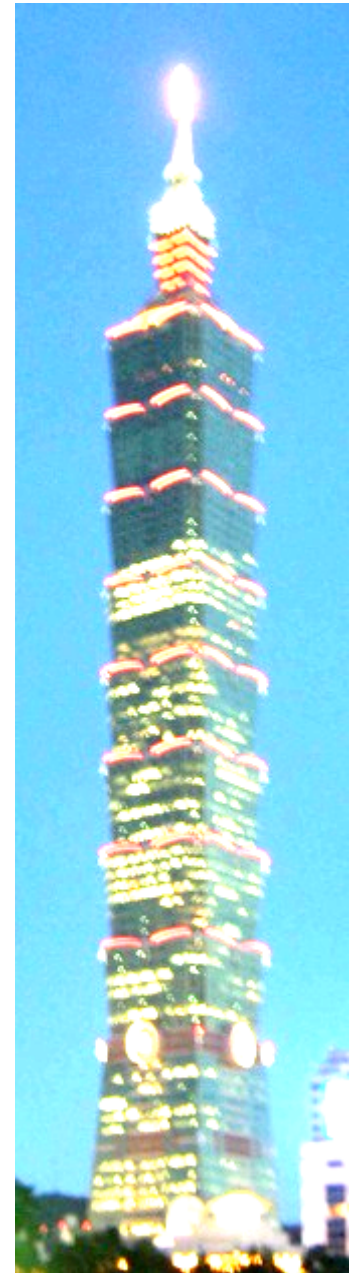
AUO



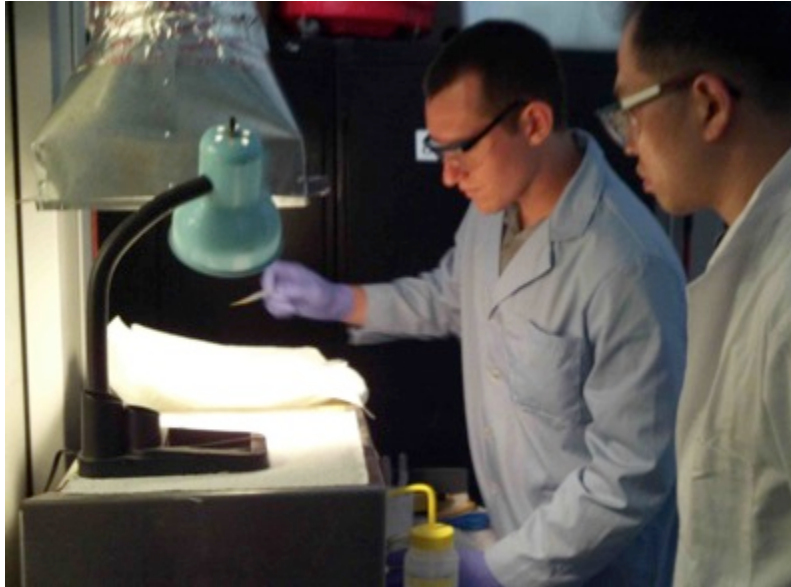
# 4. Providing Solutions

Daetec believes their success in providing solutions is based upon several values:

- Creative
- Collaborative
- Deliver on time
- Cost effective
- Business-friendly



# Collaborative



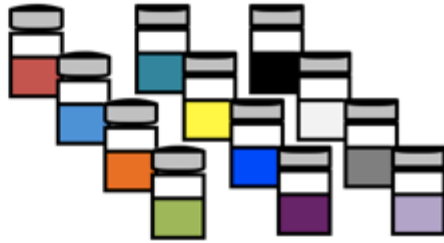
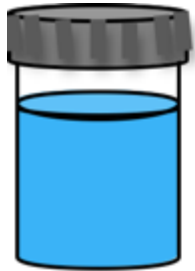
Daetec encourages client work on-site. Successful tech transfer is met through team work.



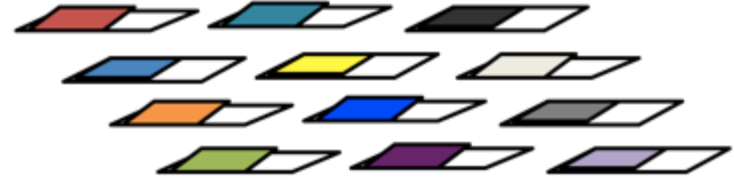
# Team Oriented Action



# Deliver in Record Time



**Compatibility**



**Applications**

**DAETEC uses screening tests over large DOEs.**

**Screening tests = many options + statistics**

**Options = less challenges + faster results**

**Fast results = on time!**



# Cost Effective

- Creative designs
- Screening tests are inherently less costly
- Multi-tasked experiments
- Simplified work

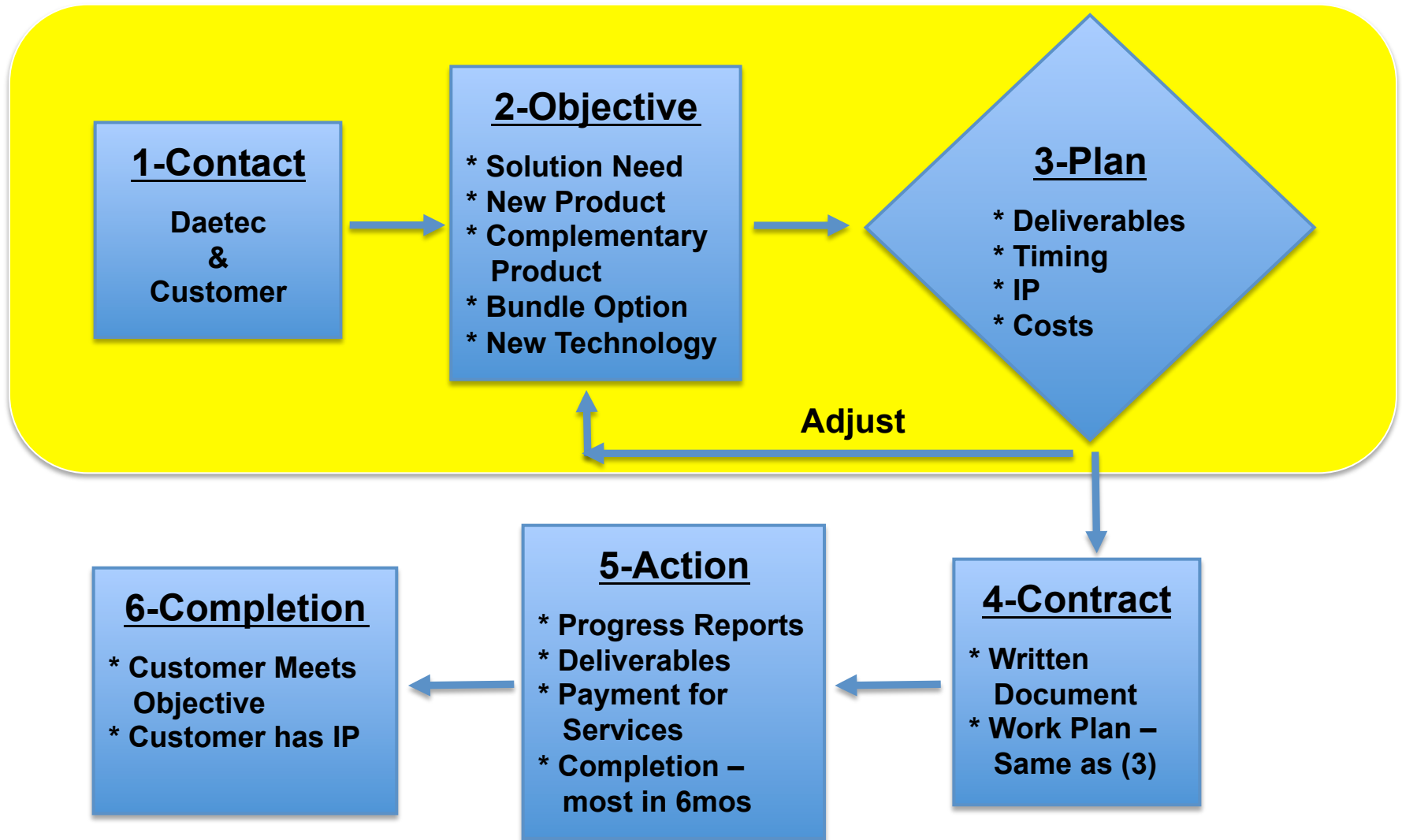


# Business Friendly

- IP Assigned to Customer
- Greater Value to Investment
- Greater Flexibility on Business Model

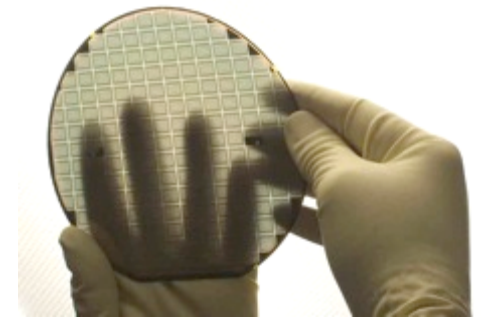


# Open Innovation Business



# 5. Previous Success (Ex. 1)

- Market: Electronics, equipment
- Customer HQ: Germany
- Technology: Semiconductor
- Class: Disruptive
- Description: Soluble composite support for thin wafers
- Process: POC + development
- Business: Fee, IP, % sales



# Previous Success (Ex. 2)

- Market: Chemical
- Customer HQ: Taiwan
- Technology: Semiconductor
- Class: Conventional
- Description: Coating and cleaning on displays and wafers
- Process: Training, development
- Business: Fee + % sales



# Previous Success (Ex. 3)

- Market: Chemical
- Customer HQ: USA
- Technology: Semiconductor
- Class: Disruptive
- Description: Cleaning baked PR w/water sol polymers
- Process: Training, development
- Business: Fee + % sales



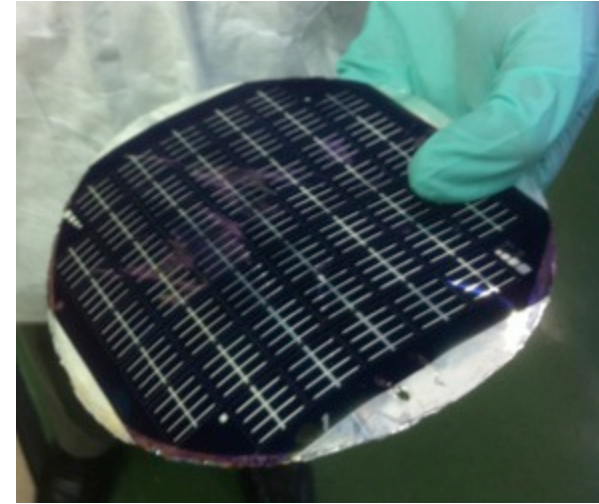
# Previous Success (Ex. 4)

- Market: Construction
- Customer HQ: USA (NS Intro)
- Technology: Roofing tiles
- Class: Conventional
- Description: Improve adhesion during inclement weather
- Process: Development
- Business: Fee



# Previous Success (Ex. 5)

- Market: Solar
- Customer HQ: USA
- Technology: Temp. adhesive
- Class: Conventional
- Description: Temporary bonding adhesive 4um silicon
- Process: Development
- Business: Fee





# Previous Success (Ex. 6)

- Market: Display
- Customer HQ: Korea (NS Intro)
- Technology: Flexible substrates
- Class: Disruptive
- Description: Temporary bonding adhesive, >400C stable
- Process: POC + development
- Business: Fee



# Summary

- Market control is difficult to maintain
- Focus on sustaining & disruptive technologies
- Providing solutions is part of achieving control
- Creativity and experience give good solutions
- Daetec has experience in several technologies
  - model is business friendly
  - successful track record
- Coordinator (NineSigma) is very helpful

# Contact for More Information

- DAETEC provides development, consulting, and technical training/support to solve manufacturing problems and introduce new options of doing business.
- Diversified Applications Engineering Technologies (DAETEC)  
Camarillo, CA (USA) (805) 484-5546  
[jmoore@daetec.com](mailto:jmoore@daetec.com); [www.DAETEC.com](http://www.DAETEC.com)