



*Adventures of a Disruptive Green Chemistry Technology:  
PureBond® Plywood*



# PureBond Hardwood Plywood

- **A decorative panel product featuring a decorative hardwood veneer face**
  - Typically 4' x 8' in size
  - Veneer core or composite core types
- **Used by wood shops and hobbyists to create**
  - Cabinetry
  - Furniture
  - Paneling
  - Shelving
  - Other interior fixtures & fittings





## What It's Used For







# Plywood Division



- **Eight Manufacturing Plants**
  - Largest HWPW footprint in North America
  - Redundant capabilities; close to market centers
- **Multi-Channel Path to Market**
  - Distributors, OEM's, Home Centers
- **In-field sales effort**
  - Intimate with customers
  - Active with architectural community





# Product Awards & Recognition

- **Gifford Pinchot Award winner**
- **Rainforest Alliance “Sustainable Standard Setter”**
- **Home Depot Vendor of the Year**
- **EPA’s Presidential Green Chemistry Award**
  - Greener Synthetic Pathway category
- **MetaFore Innovation Award**
- **Sustainable Industries**
  - Top 10 Green Building Product
- **BuildingGreen (Envir. Bldg. News)**
  - Top 10 Green Building Product
- **Architectural Record**
  - Editor’s Pick



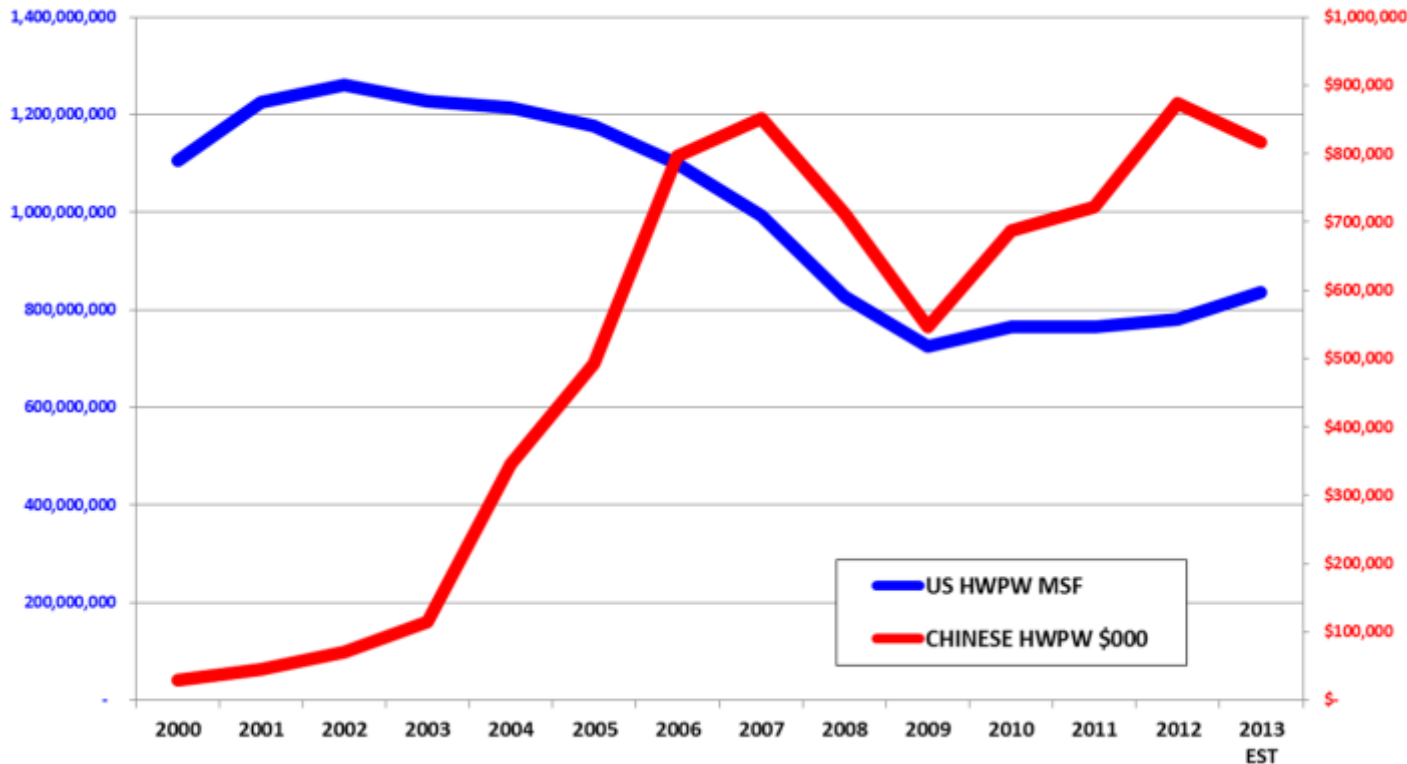




# What We've Been Up Against

- **Chinese plywood**
  - By the boatload

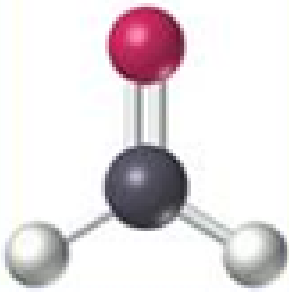
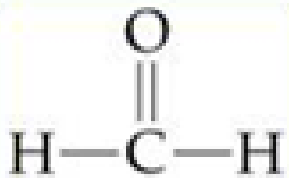
**HPVA MSF VS CHINESE HWPW IMPORT VALUE**



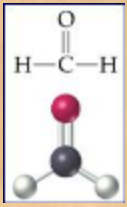
## The PureBond Experience:

# A Long-Time Early Adopter

- **A “differentiate or die” attitude was always part of our corporate culture**
  - Continental manufacturing footprint
  - Distributor rewards program
  - Employee ownership
- **We saw the formaldehyde writing on the wall**
  - The IARC (International Agency for Research on Cancer) reclassified **formaldehyde** in 2004
    - From a “probable” to a “known” carcinogen
  - LEED standards specifically called out an element found in each of our panels
    - **Urea Formaldehyde** in our resin system

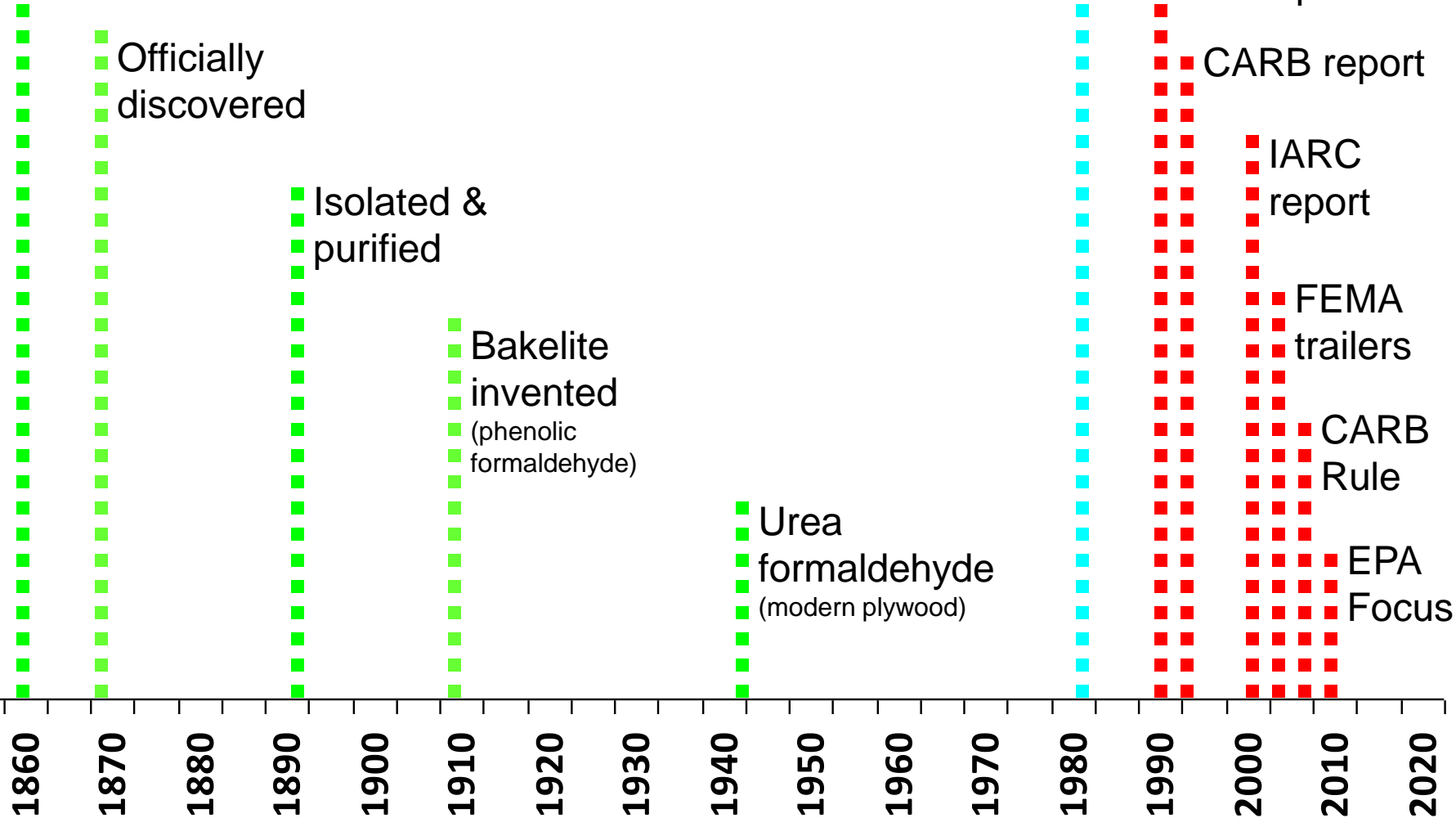






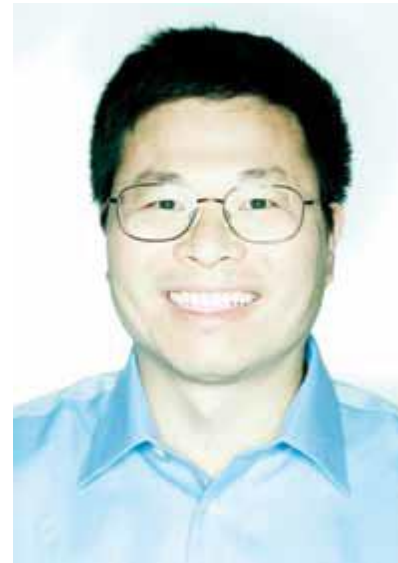
# Formaldehyde Timeline

Made by accident



# In Search of a Solution; Solution Found

- **Traditional resin suppliers were not encouraging**
- **Chance meeting with Dr. Kaichang Li lead to commercializing PureBond in 2005**



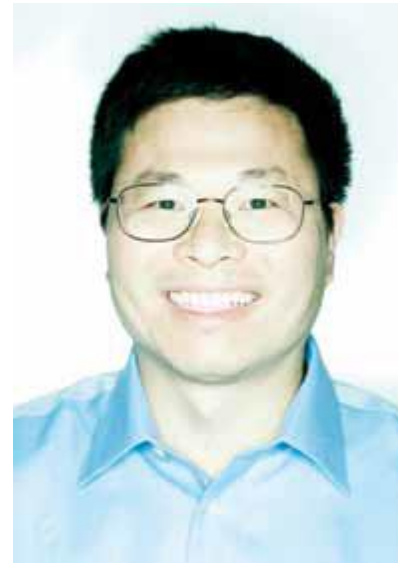
# In Search of a Solution; Solution Found

Lesson

- Traditional resin suppliers were not encouraging

Lesson

- Chance meeting with Dr. Kaichang Li lead to commercializing PureBond in 2005



## Let's Be Clear

# PureBond was a 10 on the Disruption Scale

- 180 degree turn from convention
- Polarizing within the plywood community
- In-your-face launch communications





# Reactions, Con and Pro

- **Swift, immediate and sustained rebuking from:**
  - Traditional plywood competitor/customers
  - Key customers and their
  - Trade associations
  - Key former resin suppliers and the entire
  - Formaldehyde industry
- **Calls from homeowners**
- **Requests for samples and names of cabinet shops**

# Formaldehyde is *a natural* part of our world

It is made by our bodies and occurs naturally in the air that we breathe.

Formaldehyde can be found in the trees where you play.



Environment

Economy

Applications

Health & Safety

Environment Economy Applications Health & Safety Formaldehyde Resources

## Formaldehyde Resources

- News
- Fact Sheets
- Scientific Studies
- Downloads
- Related Links
- FAQs

## Featured Scientific Study

The lowest level at which many people can begin to smell formaldehyde is about 0.3 parts per million (ppm).

Continue Reading

## Public Policy



Phasellus consequat lobortis massa. Sed consequat, elit nec placerat laoreet, eros odio nunc tor urna. Aenean rutrum, ligula eget congue aliquam, diam nunc laoreet felis, at laoreet elit dolor non metus.

Home » Formaldehyde Resources » Fact Sheets

## Formaldehyde Fact Sheets

Even simple creatures such as paramecium use formaldehyde.



Formaldehyde has been a source of food for simple life forms such as bacteria before man walked the planet. Lots of organisms use it for the carbon it contains. In the process, the simple molecule is broken down to simpler substances such as carbon dioxide. If it's not being munchied on by creatures that live in soil and water, sunlight breaks it down through a process known as photodegradation.



Nearly everything in the plant and animal kingdoms makes formaldehyde at various levels through the complicated process of living. And what the complicated organisms produce, the simple creatures eat.



The bottom line is that formaldehyde doesn't stick around very long so it doesn't accumulate in the human body or in the environment.



While little or no formaldehyde is present in the final product, the chemical is an essential building block in the production of some of the most common consumer items, including paper towels, photographic film, shampoo, deodorant, toothpaste, lipstick and nail polish and acts as an anti-bacterial agent in such consumer products as mascara.

Formaldehyde can be found in your toothpaste.



# Formaldehyde is *a natural* part of our world

It is used in the production of hundreds of beneficial products that are used every day in the home and by industry.

Environment

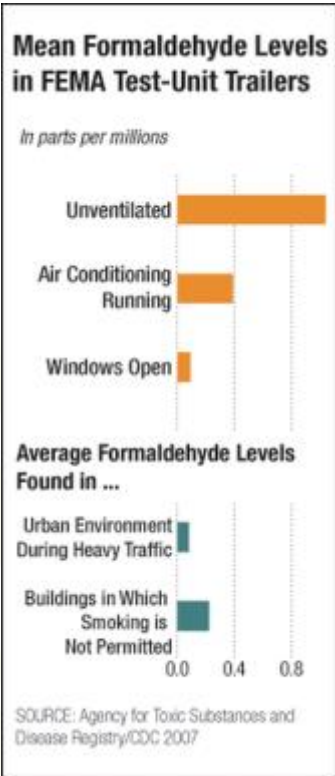
Economy

Applications

Health & Safety



# An Inconvenient Truth



## FEMA Buried Dangers of Katrina Trailers, Reps Charge

Formaldehyde risks





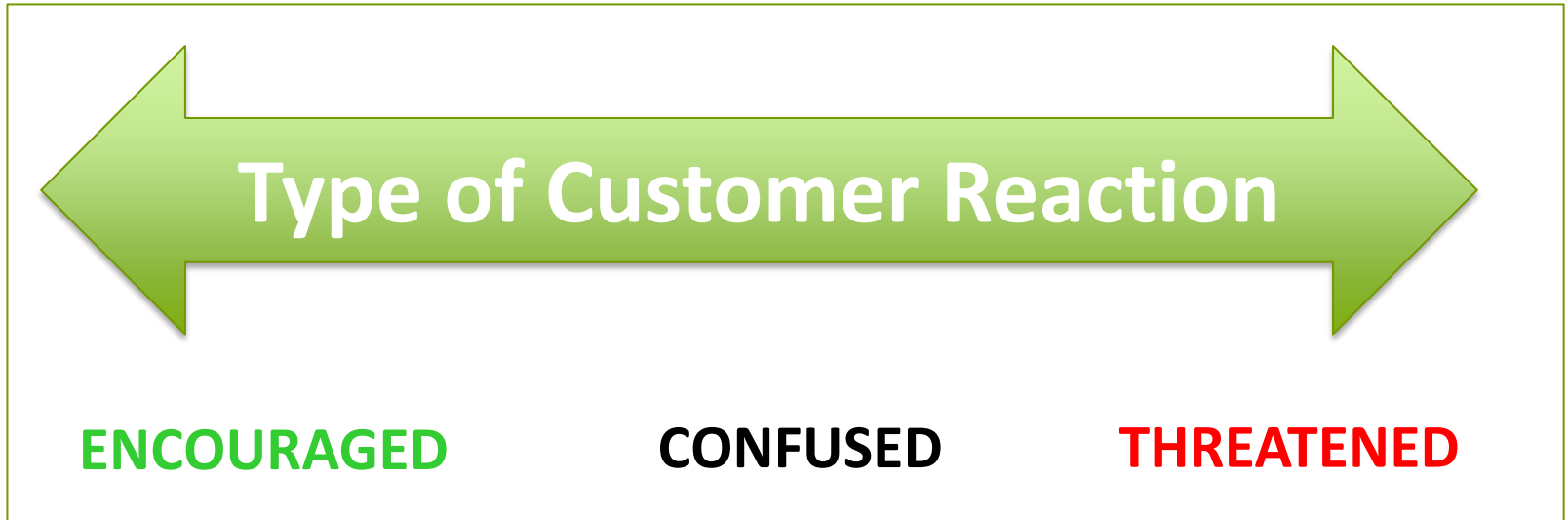


# Lessons

- **Anticipate the most extreme responses and critical attacks that may come your way**
  - Don't presume competitors or opposing forces will lie down
- **Consider leading with the positives**
- **Your earliest fans may come from the fringe**
  - But you might be surprised at where they can lead you
- **Don't discount the ability of your innovation to find some tried and true mainstream fans either**



# Polarizing Disruption: Customer Reaction



## Lesson

- Three types of customers
- Within each will be a dimension of Engagement
- Use this to your advantage

## Other Lessons

# What to Anticipate & How You Could React

- **Opposition will try to marginalize the benefits of your disruptive innovation**
  - “Oh, come on, formaldehyde isn’t so bad!”
  - “These guys are just manufacturing an excuse to make you buy their product”
  - “They’re trying to scare you!”
- **Use unexpected or high-impact ways to tell your story**
  - Imus interview
  - Sponsoring Katrina rebuilding projects
  - **“Mainstream” your innovation so it seems normal, not fringe**



## ALL PLYWOOD CONSTRUCTION

Armstrong's Origins™ Series combines the durability and value of our Genuine Allwood™ construction with the environmental benefits of sustainable, low emitting materials.

The hardwood plywood used to construct our Origins Series cabinets utilizes PureBond®, one of the latest advances in sustainable wood processing. PureBond utilizes a urea-formaldehyde free, soy based adhesive in the plywood manufacturing process.



Using Origins Series cabinets can contribute to the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED®) standards, for LEED NC EQ Credit 4.4, Low-Emitting Materials: Composite Wood. Additionally, an Origins Series cabinet and any of our solid wood center panel doors styles can satisfy the emissions standards of the California Air Resources Board (CARB) Phase 2 regulations effective January 2010.

# Customer Advocate & Mainstreaming the Benefits

In addition to outstanding sustainable benefits, choose Origins for:

- Incredible durability and strength in an all plywood box construction
- Superior moisture resistance
- Ease of installation and maintenance

# What's More Mainstream than Home Depot?

The screenshot shows the Home Depot website interface. At the top left is the Home Depot logo with the tagline "More saving. More doing.". To the right, there are navigation links for "Tool & Truck Rental", "Installation Services and Repair", and "Gift C". Below the logo, the current store is identified as "Your Store: Battleground #3605 (Change)". Further right are links for "Store Finder", "Local Ad", and "Credit". A search bar is present with the placeholder text "What can we help you find?". Below the search bar, the breadcrumb navigation reads "Home > Lumber & Composites > Plywood > Hardwood Plywood". The product being featured is "3/4 in. x 4 ft. x 8ft. PureBond Birch FSC". The product image shows a stack of plywood sheets. To the right of the image, the product details include the model and store SKU numbers, a 5-star rating with 5 reviews, and a price of \$49.97 per sheet. The stock status is "30 in Stock at Battleground #3605" in "Aisle 16 Bay 001".


THE HOME DEPOT  
More saving.  
More doing.

Tool & Truck Rental | Installation Services and Repair | Gift C

Your Store: **Battleground #3605** (Change)





Store Finder | Local Ad | Credit

Shop By Department ▾

Search All ▾ *What can we help you find?* 

Project: How-To

Home > Lumber & Composites > Plywood > Hardwood Plywood

 Share  Pin it  

**3/4 in. x 4 ft. x 8ft. PureBond Birch FSC**

Model # 332941 Store SKU # 332941

★★★★★ (5) ▾ | Write a Review +

**\$49.97** / each

**30 in Stock at Battleground #3605**  
**Aisle 16 Bay 001**  
(change pick up store)



# Sen. Klobuchar at Home Depot, with PureBond



# Over the Long Haul

- **Resist the powerful urge to chastise or embarrass those who don't hop on board**
  - (It's an everyday feeling)
- **Never forget that someday your opponents may become handy allies, now and then**

