WHAT IS JET BOARD?
Magnesium Oxide (MgO) Building Products

From the Great Wall of China

To Taipei 101 – Taiwan

100% of Boards Currently Produced by 70+ Chinese Firms
Why Magnesium Oxide (MgO)?

**MgO Key Attributes**

**People**
- Silica free installation
- No exposure to heavy metals or carcinogens
- Fire stopping, not just resistant

**Environment**
- 30-50% less energy use
- 100% recyclable
- Low CO$_2$ footprint

**Performance**
- Structural listing (US product only)
- Moisture permeability

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**MgO Benefits**

**Contractor-safe when cutting**
- Raw materials and final product are harmless
- 5X fire rating makes buildings safer which lowers insurance costs

**Enables new building methods that are more efficient**
- Can be ground into the soil as a nutrient
- Low energy input versus Portland cement
- Minimal energy input in JetProducts plant

**Uniquely suited to glue/laminate applications**
JetBoard shows an 8X improvement in fire suppression over Type X Sheetrock.

E-162 gives the flame spread and radiant heat contribution from the material. The MgO is known to have strong fire properties due to its hydrated water when made properly. This test shows how the material is absorbing the fires heat energy.

Samples are 12 mm JetBoard. Reference: 5/8” Type X Sheetrock (fire-rated gypsum).

ICC AC386 for cement boards specifies E-84 testing for flame spread and smoke formation. No MgO board should ever fail either of these tests. E162 gives a better indication of fire suppression.

Disclaimer: This test only gives directional evidence of fire resistance and should not be used in any way to infer a structural fire wall rating.

Note: ASTM E84 requires reported values to be rounded to the nearest 5.
<table>
<thead>
<tr>
<th>Attribute</th>
<th>Jet Board MgO Board</th>
<th>Portland Cement Board</th>
<th>Gypsum Wallboard</th>
<th>Gypsum Sheathing</th>
<th>Plywood</th>
<th>O.S.B.</th>
</tr>
</thead>
<tbody>
<tr>
<td>People Safe</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Fire Suppression</td>
<td>Yes</td>
<td>No</td>
<td>Slight</td>
<td>Slight</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Flame Spread</td>
<td>0</td>
<td>0</td>
<td>Low/15</td>
<td>Low/10</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Smoke Developed</td>
<td>None</td>
<td>None</td>
<td>Low/15</td>
<td>Low/10</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Water Resistant</td>
<td>Yes ***</td>
<td>No</td>
<td>Low</td>
<td>Low</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Mold/Mildew Resistant</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Vapor Permeable</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Negligible</td>
<td>Slight</td>
<td></td>
</tr>
<tr>
<td>CO2 Footprint</td>
<td>Low</td>
<td>High *</td>
<td>High *</td>
<td>High *</td>
<td>Low **</td>
<td>Moderate</td>
</tr>
<tr>
<td>Termite Resistant</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Thermal Insulation R-Value per inch</td>
<td>1.2</td>
<td>0.8</td>
<td>0.9</td>
<td>1.1</td>
<td>1.2</td>
<td>1.0</td>
</tr>
<tr>
<td>Impact Strength</td>
<td>High</td>
<td>Medium</td>
<td>Low</td>
<td>Low</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>Weight lbs/sq.ft.</td>
<td>2.1</td>
<td>2.9</td>
<td>1.9</td>
<td>2.4</td>
<td>1.6</td>
<td>2.0</td>
</tr>
<tr>
<td>Combustibility</td>
<td>Non/Com PerUL</td>
<td>Non/Com</td>
<td>Facing</td>
<td>Facing</td>
<td>Burns</td>
<td>Burns</td>
</tr>
<tr>
<td>Structural</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Freeze/Thaw</td>
<td>Good</td>
<td>Good</td>
<td>Poor</td>
<td>Poor</td>
<td>Good</td>
<td>Good</td>
</tr>
</tbody>
</table>

Note: Data are for nominal 1/2" sizes which can vary from 11-15 mm across the products above.

* Only Moderate if they recycle significant quantities of Fly Ash, which then increases the People risk factor

** Assuming that it is wood from a sustainable re-forestation program

*** Formulation and manufacturer dependant, most Chinese materials are not
Why is MgO not common outside of China?

JetProducts Addresses These Issues

- **Intellectual Property**
  - Lack of IP protection has hindered any significant improvements

- **Chemistry**
  - MgO / MgCl₂ chemistry is very sensitive, increases w/ product complexity
  - Reaction is reversible and boards degrade if not made correctly
  - Raw materials vary greatly and are limited regionally

- **Quality**
  - Chinese quality and process controls are inconsistent
MARKET / INDUSTRY
JetBoard is Changing the Game!

N. American Board Applications

Current Market Segments

- **Fire Barrier**
  - est. $6Bn*
  - Fire Walls (Silica-based products)
  - Non-structural sheathing (Type X Sheetrock)

- **Code Listed Structural**
  - est. $4Bn*
  - Structural Insulated Panels (OSB SIPS)
  - Structural Sheathing (OSB)
  - OSB Substrates for Coatings (Stucco)

- **Non-Structural, Non-Code Listed**
  - est. $5Bn**
  - Sound Board, Ceiling Tiles
  - Trim, Soffit, Siding
  - Tile Backer board
  - Non-Structural Sheathing

Future Market Segments

- **Structural Fireboard**
  - Replacement for Type X Sheetrock and provides structural strength

- **Fire Barrier**
  - Fire Walls
  - Non-structural sheathing

- **Code Listed Structural**
  - Structural Insulated Panels
  - Structural Sheathing
  - OSB Substrates for Coatings (Stucco)

- **Non-Structural, Non-Code Listed**
  - Sound Board, Ceiling Tiles
  - Trim, Soffit, Siding
  - Tile Backer board
  - Non-Structural Sheathing

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*estimate based on 2010 US Production
**estimated 2010 N American Single Family Residential Demand
### Competitive Products

<table>
<thead>
<tr>
<th>Material</th>
<th>Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fiber Cement</strong> (Portland Cement based)</td>
<td>Silicosis - handling exposure&lt;br&gt;• <em>Weight</em></td>
</tr>
<tr>
<td><strong>Sheet Rock (Gypsum)</strong></td>
<td>Fly Ash – heavy metals content and corrosion&lt;br&gt;Silicosis - most backers use Portland in addition to Gypsum</td>
</tr>
<tr>
<td><strong>OSB</strong> (Oriented Fiber Board)</td>
<td>Formaldehyde&lt;br&gt;• <em>Water soak</em></td>
</tr>
</tbody>
</table>
Structural Insulated Panels (SIPs) made with JetProducts MgO:

– Enable buildings that are fire, mold and bug resistant and use 30-50% less energy

– Use a sheathing material that is essentially carbon neutral, recyclable and disposable as a soil nutrient

– Allow for shortened construction time with significant reduction in manpower vs traditional stick framing

– Made in America with all American raw materials and equipment in a plant as safe as a bakery

– non-toxic for people to handle
• Getting the chemistry right is critical for quality

\[ 5\text{MgO} + \text{MgCl}_2 + 5\text{H}_2\text{O}(r) + 8\text{H}_2\text{O}(s) \rightarrow \text{heat} + 2[\text{Mg}_3(\text{OH})_5\text{Cl}] \cdot 8\text{H}_2\text{O}(h) \]

• Understand and verify

  • Proprietary chemical analysis and physical testing on all China and US product

• Existing Patent Protection

<table>
<thead>
<tr>
<th>US Patents</th>
<th>Filing Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>7,255,907</td>
<td>Jan.31, 2005</td>
</tr>
<tr>
<td>7,998,547</td>
<td>July 3, 2007</td>
</tr>
<tr>
<td>7,867,597</td>
<td>Aug.13, 2007</td>
</tr>
</tbody>
</table>

Certificate of Analysis

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Test Procedure</th>
<th>Results</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical and Physical Properties</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flex Strength</td>
<td></td>
<td></td>
<td>&gt;1000 lbs/in²</td>
</tr>
<tr>
<td>Density</td>
<td>ASTM 1185</td>
<td>0.85 - 1.05</td>
<td></td>
</tr>
<tr>
<td>Dimensional Tolerances</td>
<td></td>
<td>+/- 1 mm</td>
<td>Standard Sample (comparison)</td>
</tr>
<tr>
<td>Appearance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water Tightness</td>
<td></td>
<td></td>
<td>No drops after 1 hr Pass/Fail</td>
</tr>
<tr>
<td>Formulation Efficacy</td>
<td>Jet Proprietary</td>
<td>&gt;50 dry application, &gt;70 wet</td>
<td></td>
</tr>
<tr>
<td>Cement Stability</td>
<td>Jet Proprietary</td>
<td>&lt;10 dry application, &lt;4 wet</td>
<td></td>
</tr>
</tbody>
</table>
Third Party Certified Quality Process

• The first MgO to be manufactured and certified in the US

• Certification includes:
  – Process
  – Lab
  – Manual
  – Product

• Certification process on the Demo Plant took 9 months and will transfer to Full Scale plant following start up audit
OWNER PROFILES
AND HISTORY
John W. Wisenbaker, Sr

- Founder of Wisenbaker Builder Services ("WBS") - [www.wisenbaker.com](http://www.wisenbaker.com)
- Owner PBA Stones [www.pbastones.com](http://www.pbastones.com). From quarrying activities to shipping operations, PBA Stone is a fully-integrated company. This integration, combined with an attractive range of classic and exotic materials, enables the company to exercise total control of the quality of its block and slab production. The result is a predictable supply of stones to its clients from a Master Block & Slab Exporter.
- Owner American Vintage Group [www.americanvintagegroup.com](http://www.americanvintagegroup.com) American Vintage Group was formed with the established purpose of bringing global product opportunities of the highest overall value and design to the American market. Through the implementation of strategies that work together to effectively collapse the product supply chain, the American Vintage Group continues to employ a "Quality First" approach to fulfilling its key objective of "Redefining Quality - Worldwide".
- Owner of Dipper Ranch - [www.DipperRanch.com](http://www.DipperRanch.com)

John W. Wisenbaker, Jr.

- President of WBS
- Principal in Flint Oak Energy - [www.flintoakenergy.com](http://www.flintoakenergy.com)
- Co-founder of US Stone - US Stone was the manufacturer, fabricator, marketer, and distributor for Avanza brand quartz countertops. Avanza became the exclusive brand of quartz offered at Lowe’s stores throughout the United States. US Stone was sold to the owner of Mills Pride cabinets in July 2001. The acquiring company was Ideal Brands. John was named President of Ideal Brands in September 2001.
Michael E. Feigin
- Owner and co-founder of Main Street America - [www.mainstreetamerica.com](http://www.mainstreetamerica.com)
- CEO and Founder of Design Tech Homes - [www.dth.com](http://www.dth.com)
- Owner Criterion Mortgage Company – [www.criterionmortgage.com](http://www.criterionmortgage.com)
- Division President David Weekley Homes [www.davidweekleyhomes.com](http://www.davidweekleyhomes.com) Since 1976, one of America’s most-recognized new home builders delivers excellence in Design, Choice and Service to hundreds of communities in more than 14 cities.

Jim Wambaugh
- President of Jet Products – [www.jet-board.com](http://www.jet-board.com)
- Retired Ch.Eng./MBA from Shell Oil Company after 25 years in the oil and chemicals industry:
  - Developed and led Business Improvement programs for Shell and other leading oil and gas companies including Executive assessment and coaching.
  - Developed Business Development program for $1B+ dealmakers in conjunction with Harvard, Duke and Jeff Thull (Prime Resource Group).
  - Negotiated multi-million dollar deals in 23 countries around the world
  - Ran a global technology business for 8 years that was responsible for producing 50% of the world’s styrene supply.
History of JetProducts

2005
• Begun as a standalone company by the owners of Wisenbaker Building Services and Design Tech Homes. WBS and DTH are both major players in the Texas residential home market (the largest residential home market in the US).
• Filed for first patent Jan. 31 and imported first boards (from China)
• Focus was primarily trim and backer materials as a James Hardie replacement product

2006-9
• Large effort to find quality, reliable and trustworthy suppliers
• Full QC program in place and boots on the ground in China to ensure quality.

2010
• Decision made that new product formulations couldn’t be protected and the quality process was unlikely to produce ICC code listings.
• Began R&D work in Houston and startup of commercial scale demo plant
2011

- 400+ lab formulations studied
- 67 JetBoard full size demo formulations produced
- 70% design of full scale plant (1.5 Mil Boards/year)
- Building small commercial plant (150k Boards/year)
- Site selection began
- State and Federal Grant process in full swing
  - Texas / Utah / South Carolina

2012

- Site list narrowed in Texas to:
  - Taylor, Freeport, Bastrop, Dayton
- Plant Design and Vendor selection process completed in early 4Q
- **ICC Code listing** process in progress
  - Engineer certification complete: quality manual, manufacturing process & quality lab
  - Remaining Activity: Board testing
- JetProducts leverages IT, Engineering and HR employees from WBS
- Began commercial production with US demonstration plant in 3Q