LINERITE®
Composite Batterboard System

- Low Friction UHMW-PE Face
- Impact-Absorbing Core

Duramax Marine® is an ISO 9001:2015 Certified Company
LINERITE® composite batterboard is an engineered product designed specifically for high frictional wear applications where heavy impacts occur. It absorbs impact energy like no other material and provides a nearly indestructible layer of protection.

It is a unique, relatively hard and dense material that is a long-lasting, highly effective, environmentally friendly batterboard that is infinitely superior to traditional batterboard materials.

The Ultimate Batterboard.

Two Integral Materials Fused Together At The Molecular Level.
Using heat and extreme pressure, the LINERITE® UHMW-PE facing and impact-absorbing core is blended into a remarkable composite product structure that is virtually impossible to separate.

Recessed Stud Fastener System Prevents Shearing.
Custom fabricated recessed mounting holes reduce bolt stress and prevent dangerous shearing of bolts or studs during impact.

0.12 Low-Coefficient Of Friction UHMW-PE Facing.
The Ultra High Molecular Weight Polyethylene (UHMW-PE) facing layer material protects and extends the wear life of your vessel, pilings and dock structure.

Proprietary Energy Absorbing Composite Core
Unlike straight UHMW-PE plastic panels which transfer impact energy directly to the substructure causing damage, LINERITE® with its superior energy absorption protects the substructure and vessel from damage.
## LINERITE DATA

<table>
<thead>
<tr>
<th>Test</th>
<th>Standard LINERITE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FRICTION</strong></td>
<td></td>
</tr>
<tr>
<td>Coefficient of Friction - surface ASTM-D-1894</td>
<td>0.12</td>
</tr>
<tr>
<td><strong>IMPACT RESISTANCE</strong></td>
<td></td>
</tr>
<tr>
<td>Impact Strength ASTM-D-256 method A unnotched</td>
<td>166</td>
</tr>
<tr>
<td>Cracks or breaks</td>
<td>No</td>
</tr>
<tr>
<td><strong>RESILIENCE</strong></td>
<td></td>
</tr>
<tr>
<td>Resilience - ASTM-2632</td>
<td>11%</td>
</tr>
<tr>
<td><strong>OTHER PERFORMANCE FACTORS</strong></td>
<td></td>
</tr>
<tr>
<td>Molecular Weight of UHMW-PE Surface Layer</td>
<td>&gt;3.1 x 10^6</td>
</tr>
<tr>
<td>Water Absorption (by wt.)</td>
<td>Negligible</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-20 to 125°F</td>
</tr>
<tr>
<td>Marine Organisms</td>
<td>No Effect</td>
</tr>
<tr>
<td>Oil Exposure</td>
<td>No Effect</td>
</tr>
<tr>
<td>Withstands Repeated Heavy Impact</td>
<td>Yes</td>
</tr>
<tr>
<td>Weight per ft² (1/2” Thick Surface Layer)</td>
<td></td>
</tr>
<tr>
<td>2” Thick</td>
<td>10.7 lb.</td>
</tr>
<tr>
<td>3.5” Thick</td>
<td>19.4 lb.</td>
</tr>
</tbody>
</table>

**Structural Integrity: Spans for mounting braces** - LINERITE can be used in unsupported spans of up to 36”. Spans greater than 36” require a supporting substructure.

This proprietary designed protection system greatly reduces the transfer of energy to the substructure. And, unlike solid rubber with its low energy absorption, there is no “sling shot effect” that could cause damage to the vessel.

Energy-Absorbing Composite Core With Low Reaction Force.

**LINERITE® HAS A PROPRIETARY DESIGNED CORE**
that combines a thermoset elastomer and plastic creating a resilient alloy layer with a very low reaction force.

**SUPERIOR ENERGY ABSORPTION**
Absorbs force with room to bulge on impact

**DELAYED ELASTIC RESPONSE**
Returns to Original Dimension in 5 Sec. – 1 Hr.

**VIRTUALLY INDESTRUCTABLE**
Withstands repeated heavy loads & impacts

**UHMW-PE Facing With 0.12 Low-Coefficient Of Friction.**
Unlike some manufacturers that use recycled materials that reduce impact strength and wear life of the batterboard, the LINERITE® facing is virgin UHMW-PE with an extremely low coefficient of friction.

**ABRASION RESISTANT**
Low coefficient of friction and high impact strength reduces batterboard wear.

**VIRTUALLY UNBREAKABLE**
Resists cracking, tearing or breaking down under heavy loads.

**LONG LIFE IN TOUGH CONDITIONS**
Resists corrosion, unaffected by marine organisms and extreme weather.

Recessed Stud Fastening System Protects Against Damage and Injury.

**NO EXPOSED FASTENERS**
that can be sheared off causing serious injury and damage.

**BOLT STRESS IS REDUCED**
because the LINERITE® core composite compresses upon impact – unlike solid rubber that bulges around its fasteners causing them to shear off or potentially becoming dangerous projectiles.

**TIGHT INSTALLATION** of LINERITE® to substructure is assured. Mounting fasteners can be tightened against the dense alloy core to form a tight long-lasting bond.
Engineered For Unmatched Impact Performance.

When it comes to impact performance, LINERITE® Composite Batterboard absorbs impact energy and withstands repeated high-impact blows far better and longer than wood, or any other standard batterboard material.

### ENGINEERED FOR UNMATCHED IMPACT PERFORMANCE

Linerite® (2” thick)  
Linerite® (3.5” thick)  
Solid UHMW-PE (3.5” thick)  
Douglas Fir (3.5” thick)

<table>
<thead>
<tr>
<th>Energy Absorption</th>
<th>LINERITE®</th>
<th>Solid UHMW-PE Panels</th>
<th>Wooden Timbers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ENERGY ABSORPTION</strong></td>
<td>High-energy absorption</td>
<td>Low energy absorption</td>
<td>Good energy absorption</td>
</tr>
<tr>
<td><strong>TRANSFER OF IMPACT ENERGY</strong></td>
<td>Absorbs repeated impacts assuring substructure protection</td>
<td>Transfers energy to substructure causing damage</td>
<td>Only good for one severe blow, then loses favorable characteristics</td>
</tr>
<tr>
<td><strong>ELASTIC RESPONSE</strong></td>
<td>Delayed response. No sling shot effect</td>
<td>High rebound. Produces undesirable sling shot effect</td>
<td>Starts losing original elastic efficiency after first impact</td>
</tr>
<tr>
<td><strong>RECOVERY</strong></td>
<td>Returns to original shape in 5 seconds to 1 hour</td>
<td>Stays hard, absorbs relatively no energy force</td>
<td>Irreversible damage</td>
</tr>
<tr>
<td><strong>LIFE CYCLE</strong></td>
<td>Almost indestructible</td>
<td>Recycled UHMW-PE reduces wear life</td>
<td>Crush and splinter upon</td>
</tr>
</tbody>
</table>

### FORCES/SQUARE FOOT AND DEFLECTION

- **Timbers crushed – permanent deformation**

### ENERGY ABSORPTION AND RECOVERY

<table>
<thead>
<tr>
<th>Energy Absorbed (in-lb./ft² thousands)</th>
<th>% of Recovery</th>
<th>% of Recovery after 200,000 psf load</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.2</td>
<td>0</td>
<td>0.2</td>
</tr>
<tr>
<td>0.4</td>
<td>20%</td>
<td>0.4</td>
</tr>
<tr>
<td>0.6</td>
<td>40%</td>
<td>0.6</td>
</tr>
<tr>
<td>0.8</td>
<td>60%</td>
<td>0.8</td>
</tr>
<tr>
<td>1.0</td>
<td>80%</td>
<td>1.0</td>
</tr>
<tr>
<td>1.2</td>
<td>100%</td>
<td>1.2</td>
</tr>
</tbody>
</table>

### ELASTIC RESPONSE

- **LINERITE®**  
- **Solid UHMW-PE Panels**  
- **Wooden Timbers**

### RECOVERY

- **LINERITE®**  
- **Solid UHMW-PE Panels**  
- **Wooden Timbers**

### LIFE CYCLE

- **LINERITE®**  
- **Solid UHMW-PE Panels**  
- **Wooden Timbers**
LINERITE® Has a Lower Life-cycle Cost Than Wood.

LINERITE® Composite Batterboard provides a nearly indestructible layer of protection and requires minimal maintenance. Unlike wood, that leaches chemicals into the environment, LINERITE® is friendly to the environment. It is the superior performing substitute for wood that is sacrificial in nature, requiring repair and replacement.

LINERITE® Vs. Wooden Timbers
Comparison Chart

<table>
<thead>
<tr>
<th></th>
<th>LINERITE®</th>
<th>Wooden Timbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Absorption</td>
<td>0.02%</td>
<td>100%</td>
</tr>
<tr>
<td>Oil Exposure</td>
<td>Just wash down</td>
<td>Needs replacement</td>
</tr>
<tr>
<td>Marine Organism</td>
<td>Inert</td>
<td>Shortens life</td>
</tr>
<tr>
<td>Chemicals</td>
<td>Just wash down</td>
<td>Deteriorates</td>
</tr>
<tr>
<td>Freezing Temperatures</td>
<td>Unaffected</td>
<td>Cracks</td>
</tr>
<tr>
<td>Flame Spread</td>
<td>14</td>
<td>34</td>
</tr>
<tr>
<td>Environmental Safety</td>
<td>Environmentally friendly</td>
<td>Leaches harmful chemicals</td>
</tr>
<tr>
<td>Maintenance</td>
<td>Practically none</td>
<td>High maintenance</td>
</tr>
<tr>
<td>Service Life</td>
<td>Virtually indestructible</td>
<td>Replaced often</td>
</tr>
</tbody>
</table>

LINERITE® Reduces Maintenance Costs On 49’ BUSL U.S. Coast Guard Buoy Tender.

Wood batterboard on the buoy tender has been replaced with LINERITE® because of the sacrificial manner in which wood dissipates impact forces and resists wear. Impacts, oil, biological and chemical action does irreversible damage to wood, causing it to be maintained and replaced far too often.
Perfect System For a Variety of Marine Applications.

U.S. Coast Guard Chooses LINERITE® For Well Deck.

When the U.S. Coast Guard replaced the well deck pads on their 87’ Protector Class vessel, they chose LINERITE®. Its low friction and energy absorption characteristics made it the perfect material to use in this tough working environment. The LINERITE® was custom fabricated for quick installation.

TYPICAL APPLICATIONS INCLUDE:

- Dock facings
- Bridge fenders
- Wharf, pier and lock fenders
- Dry dock walls and side rails
- Pipeline fenders
- Floating docks
- Piling Facing
- Wing walls
- Offshore pump station fenders
- Boat rails and gunnels
- Ferry terminals
- Canal lock walls
- Canal lock door panels
- Vessel well decks
- Bilge block facings
- Passenger ferry
- Commercial crab fishing vessels
LINERITE® Can Be Designed and Manufactured For Custom Applications.

Our impact protection system expert will work with you to meet your specific application requirements. They will design and build a custom size and thickness, create a special configuration, or manufacture a face surface to match a custom color.

Pre-curved for easy installation

Duramax® will engineer an impact system that will perfectly match your application. This will save installation time and money.

Custom sizes upon request

LINERITE® can be manufactured to the right length, width and thickness, and then drilled to meet your installation requirements.

Custom color

LINERITE® UHMW-PE facing comes in black and yellow as standard colors. The face material can be manufactured to match any custom color.
Methods Of Installing LINERITE® To Match Your Application.

Consult with a Duramax® impact protection system expert to discuss your method of installation. Then, Duramax® will prepare LINERITE® to fit that mounting method and your specifications.

**Custom mounting holes**

Our recessed stud fastening system is custom fabricated to fit your application perfectly, making on-site installation easy and less costly. And, LINERITE® is lightweight making it easy to handle.

**Standard sizes in stock**

LINERITE® is readily available in standard sizes. Our LINERITE® expert will consult with you to help select the right size for your specific application.

<table>
<thead>
<tr>
<th>STANDARD SIZES AVAILABLE:</th>
</tr>
</thead>
<tbody>
<tr>
<td>LENGTH</td>
</tr>
<tr>
<td>---------</td>
</tr>
<tr>
<td>6’</td>
</tr>
<tr>
<td>6’</td>
</tr>
<tr>
<td>4’</td>
</tr>
</tbody>
</table>

Can be cut and fabricated to desired dimensions
NOTES:
Duramax Marine® is committed to providing excellence in every product we manufacture. Our Johnson Cutless® marine and industrial bearings, heat exchangers, impact protection systems and sealing systems are known worldwide for their engineered quality and dependable performance. Please contact the factory for information on any of the following Duramax Marine® products:

**JOHNSON CUTLESS® WATER-LUBRICATED BEARING SYSTEMS**
- Johnson Cutless® Sleeve and Flanged Bearings
- DX 490 Rudder Bushings

**DURAMAX® ADVANCED WATER-LUBRICATED BEARING SYSTEMS**
- Johnson® Demountable Stave Bearings
- ROMOR®I Stave Bearings and Segmental Housings
- ROMOR® C- Partial Arc Bearings
- DMX® Polymer Alloy Bearings
- DuraBlue® Bearings, Rudder & Pintle Bushings, Thrust Washers, and Wear Pads
- Industrial Pump Bearing Systems

**DURAMAX® HEAT EXCHANGE SYSTEMS**
- DuraCooler® Keel Coolers
- Duramax® Demountable Keel Coolers
- Duramax® BoxCoolers
- Duramax® Plate Heat Exchangers

**DURAMAX® IMPACT PROTECTION SYSTEMS**
- Johnson® Commercial Dock Bumpers, Fenders & Tow Knees
- Weatherstrip Door Gaskets, Window Channel and Hatch Cover Gaskets
- LINERITE® Composite Batterboard Systems

**DURAMAX® SHAFT SEALING SYSTEMS**
- DryMax® Shaft Seal & Rudder Seal
- Duramax® Mechanical Shaft Seal
- Johnson® Heavy-Duty Air Seal Stuffing Boxes
- Duramax® Ultra-X® High Performance Compression Packing
- Johnson® Strong Boy Stern Castings and Stuffing Boxes

Duramax Marine® is an ISO 9001:2015 Certified Company