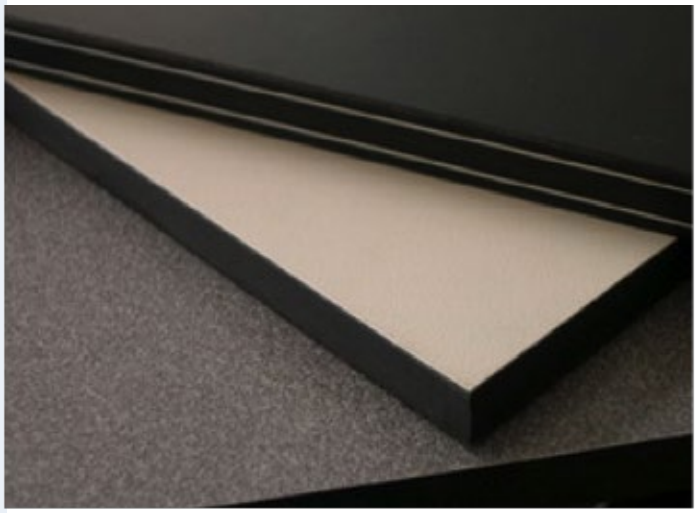
MicroPly

Next-Generation Structural Composites:
Green • Custom • Robust • Formable

Structural Laminates/Composites

MicroPly™ allows traditional laminate makers to "go green" by using their same layering and pressing equipment while eliminating formaldehyde.



APPLICATIONS

MicroPly can revolutionize structural composite solutions for horizontal and vertical applications (heavy duty) as found in a host of industrial and commercial applications:

- Compact Laminates
- Structural Composites
- Multilayer Postformed Composites
- Flooring and Counter Tops
- Office and Home Furniture
- Store Fixtures
- Ceiling and Wall Panels
- Signage and Digital Print Media

Today's decorative surfacing and structural composite markets face many challenges:

- Manufacturers are pressured to remove red-list materials like formaldehyde and PVC that are present in traditional laminates. Green alternatives exist, but not a "substrate + surfacing system" that meets both performance and cost specifications.
- Customers are increasingly demanding about the custom look and aesthetic appeal of decorative laminate surfaces. Traditional suppliers only provide a few, standard patterns that limit the creativity of architectural and product designers.
- Product designers and installers want surfacing solutions that are formable around contours and edges. Standard laminates are not formable, requiring edge-banding steps that create manufacturing inefficiencies and color-pattern-matching headaches.
- Composite engineers need more "layer innovations"— finding new ways to combine novel materials (cellulose, fiberglass, carbon fiber, wood veneers, etc.) to yield structural composites with enhanced durability, strength, and aesthetics. Today, the market employs the same formaldehyde-saturated Kraft paper layers used for decades.

Biovation's MicroPly technology combines biobased polylactic acid films with digital printing and tailored wear-layer innovations to create cost-competitive, next-generation laminates that solve all of the aforementioned problems—taking surfacing and structural composites to a new level.

Biovation Acquisition COMPANY

Montgomery, MN | Broadway, NC
Wilmington, DE

BENEFITS

- **Red-list free:** **MicroPly** provides a decorative surfacing and structural composite solution that is 100% free of harmful red-list materials like formaldehyde and PVC.
- **Custom look:** With **MicroPly**, the look of a surface is limited only by your imagination. Teddy Bears and stethoscopes for a pediatric hospital, Brazilian rosewood for a conference table, your team's logo throughout a sports stadium—whether based upon scanned originals or computer generated images, **MicroPly** is unrivaled in bringing surface aesthetics to the 21st century.
- **Formable:** Thick **MicroPly** can serve directly as a structural composite which can be formed around various contours (with additional formability for thinner versions).
- **Robust:** **MicroPly** can be designed to exceed the wear resistance of traditional high-pressure laminates used in flooring and countertop applications.
- **Enables new layers for new attributes:** Most laminates only employ the Kraft-paper layers used for decades. **MicroPly** allows the incorporation of a host of other layer types (e.g., other papers, fiberglass, wood veneers, carbon fibers, and combinations) enabling strength and other properties to be tailored for a host of applications.

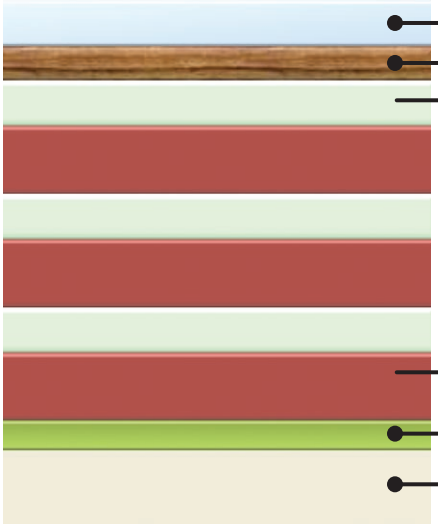
IP PROTECTION STATUS

MicroPly and related technologies are protected by patents, pending applications, and trade secrets.

HOW IT WORKS

Traditional high-pressure laminates are formed by subjecting a stack of formaldehyde-saturated Kraft paper layers to high pressure and temperature to form composites capped with a decorative paper layer. **MicroPly** uses a similar yet formaldehyde-free process. Instead, thin layers of bio-based polylactic acid are used as the saturation agent, and the stack requires lower temperature and pressure. Finally, a high-definition print layer is created and capped with a transparent wear-resistant layer. **MicroPly** products can be manufactured to a specified thickness ranging from 10 mils to 1 inch.

Compared to HPL, **MicroPly** is formaldehyde free while having higher scratch resistance, better formability, unrivaled surface aesthetics, and nearly limitless layer-composition options. **MicroPly** provides a next-generation composite to new market entrants or incumbents who want to remove controversial red-list materials while leveraging much of their existing HPL equipment.



MICROPLY VS. BIOSURF

Compared to Biovation's BioSurf, **MicroPly** can create standalone composites and could be more easily adopted by traditional laminate makers.

MicroPly has been successfully tested by high pressure laminate (HPL) and wood veneer companies on both pilot and production-level equipment.

TWO WAYS TO MAKE "GREEN" LAMINATES

	BioSurf	MicroPly
Application	Surfacing solution (bond to a substrate)	Surfacing and structural (bond or standalone)
Production Readiness	Produced at scale	Prototype/ Pilot state
Equipment	No hot press required	Same hot press and layering as traditional laminates

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