

Fire-Resistant Architectural Surfaces

BioFire™ offers a combination of fire resistance, aesthetic appeal, and material sustainability not previously available in fire-resistant coating solutions.



APPLICATIONS

BioFire can be applied to any decorative or structural surface where fire-resistance is desired:

- ▶ **Architectural** (e.g., walls, elevators, ceilings, doors)
- ▶ **Industrial** (e.g., housings, enclosure doors, electronics)
- ▶ **Transportation** (e.g., aircraft, automotive, watercraft, rail)

Fire protection in buildings is of increasing global concern. The global flame retardants market is projected to reach nearly \$6 billion by 2018 (Ceresana Research). Architectural surfaces (e.g., walls, doors, floors, and ceilings) can rarely withstand fires indefinitely, but can provide invaluable time for human escape and fire-department intervention. The National Fire Protection Association (NFPA) recognizes intumescent (often mixed into paints) as a key technology in increasing fire safety in buildings. Upon fire exposure, intumescent expand into a thick char foam that deters a flame from igniting underlying materials - providing a fire-resistant blanket for architectural surfaces.

An intumescent, however, must remain undamaged during the days, months, or years it lays dormant. A scratch in an intumescent coating leads to a breach in the “fire blanket” that places the underlying surface—and building—at risk. Intumescent also offer limited decorative appeal. If decorative overlays are used, care must be taken that such materials do not deter intumescent performance and do not create other fire and health risks (e.g., fire acceleration and toxic fumes).

Biovation's BioFire technology provides a unique fire-protection solution that, beyond the basic fire resistance of intumescent, provides extra scratch protection, facilitates the addition of other fire retardants, offers far greater decorative appeal, and uses 100% red-list-free materials.

BENEFITS

- ▶ **Protects intumescent from scratches:** BioFire provides a “shield” for an intumescent, protecting it from scratches that could render the coating ineffective for fire resistance.
- ▶ **Facilitates the addition of other fire retardants:** BioFire’s core bioplastic layer can accept fire-retardant compounds to provide extra fire resistance, if needed.
- ▶ **Offers unlimited decorative appeal:** BioFire allows for the application of custom digital, high-definition images protected by a transparent polylactic acid layer to provide virtually any surface look imaginable.
- ▶ **Uses 100% red-list-free materials:** BioFire is made from biobased materials (derived from corn and soybeans) with a low smoke index which do not emit the toxic fumes like many building materials such as PVC.
- ▶ **High formability:** BioFire layers can be laminated, post-formed, or vacuum formed to a host of surfaces and contours.

BIOFIRE IN ACTION

BioFire has been proven to provide enhanced fire resistance compared to other surfacing solutions such as PVC.

IP PROTECTION STATUS

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

HOW IT WORKS

BioFire integrates an intumescent layer with a special bioplastic such as polylactic acid that provides fire-resistance protection and replaces intumescent coatings. BioFire can be produced in film or sheet integration colors, prints, or other decorative surfaces.

BioFire’s bioplastic film protects the intumescent layer from scratching and interference with the intumescent layer. Normal intumescent come in a paint or coating which requires field application and is limited in aesthetics to a solid color paint subject to scratching which reduces the effectiveness of the intumescent.

BioFire uses a PLA bioplastic formulated to quickly “liquify” during direct flame contact absorbing into the intumescent layer which allows the intumescent layer to work.

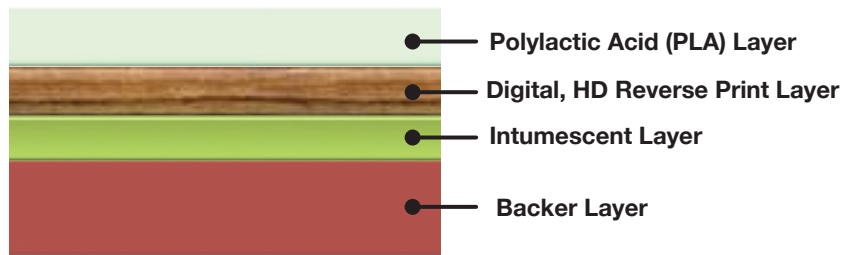
Unlike most fire-protection solutions, BioFire films can be digital printed, conventional printed, colored or textured to create a wider range of aesthetics in fire protection.

When burned, BioFire produces very little smoke. This smoke is clear or slightly white as compared to black toxic smoke from petrochemical products. Other plastic films will restrict the intumescent from working properly and have a negative effect on its overall fire performance.

BioFire films or sheets can be laminated, postformed, or vacuum formed into a myriad of shapes and products. By integrating a thermoset of fiber reinforced backer, free-standing forms can be produced with the highest levels of fire protection.

BIOFIRE

Glue or thermoform to substrates



Benefits of Surfacing Solution	Traditional Intumescent Solutions	BioFire
Basic fire protection	✓	✓
Intumescent protected from scratching	X	✓
Allows addition of other fire retardants	X	✓
Offers unlimited decorative appeal	X	✓
Clean installation and high formability	X	✓