

# SOYAD™ PLUS ADHESIVES

The natural choice for hardwood plywood



- Cost Competitive with Urea Formaldehyde
- Superior Bond Strength and Fiber Tear
- Strong Adhesion to Difficult Veneers
- No-added-formaldehyde (NAF) Adhesive
- EPA and CARB Phase 2 Exempt

## Technology Overview

Soyad™ Plus adhesive technology is a patented, no-added formaldehyde (NAF) adhesive system from Solenis that is used to manufacture environmentally-friendly hardwood plywood panels. These adhesives are used to produce panels with veneer, particleboard or medium-density fiberboard cores. Soyad Plus adhesives are water-based systems formulated with natural soy flour, a proprietary amine-based resin and a water dispersible aliphatic isocyanate (wHDI) crosslinker. When blended together the resin and crosslinker react with the protein in the soy flour to form a durable and water-resistant thermoset adhesive. The wHDI crosslinker significantly boosts adhesion and allows for deeper penetration of the glue into the wood veneers.



## Process Parameters

When converting from a formaldehyde-based adhesive to a Soyad Plus adhesive, some mixing system changes are usually required. However, Soyad Plus adhesives are easily applied using the same spreaders typically used for formaldehyde-based adhesives and spread rates, press temperatures and press times are similar to those of formaldehyde based adhesives.

Compared to other adhesives, Soyad Plus adhesives have a longer pot life, which reduces the risk of the adhesive hardening in process piping. Other comparisons are shown in Table 1.

Table 1

ADHESIVE & PROCESS	SOYAD PLUS	SOYAD	UF	PVA
Long Pot Life	⊖	⊖	⊘	○
Easy Mixing & Spreading	⊖	○	●	●
Resistant to Bleed-through	⊖	○	⊖	●
Long Open Time	⊖	⊖	●	⊘
Excellent Tack	○	○	●	⊖

Better ● ⊖ ○ ⊘ ● Worse



## Performance Advantages

Commercial applications have demonstrated that Soyad Plus adhesives provide a number of performance advantages (see Table 2) for hardwood plywood manufacturers. Consider the following:

- Cost competitive with formaldehyde-based adhesives and other NAF technologies.
- Provides excellent knifing results and 3-cycle soak performance.
- Bonds well to difficult veneers such as Maple, Douglas Fir and Ponderosa Pine.

Table 2

COST & BOARD PROPERTIES	SOYAD PLUS	SOYAD	UF	PVA
Low-cost Adhesive	⊖	⊖	●	⊘
Bonds to Difficult Veneers	●	⊖	●	●
Knifing - High % Fiber Tear	●	⊖	●	●
No Added Formaldehyde	●	●	●	●

## Formaldehyde Emission Standards

Hardwood plywood panels made with Soyad Plus adhesives meet all global formaldehyde emission standards, including EPA 40 CFR Part 770, CARB Phase 2, European E0 and Japanese F★★★★ standards. Also, hardwood plywood panels produced with Soyad Plus adhesives qualify for “Exempt” status with both the EPA and CARB. EPA-Exempt means users will qualify for reduced testing and will have a significantly reduced risk of producing non-complying lots requiring 72 hour customer notification.

## More Information

To learn more, contact your local Solenis field representative or visit us online at [soyad.com](http://soyad.com)

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