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## Tips for Selecting and Installing Plywood Underlayment

by Christopher Capobianco

July 27, 2007

*The experts agree: There are better choices than lauan for resilient underlayment.*



Plywood with knots should not be covered with resilient flooring, even if the knots are patched first. This floor should be covered with an underlayment grade plywood.

In fielding technical calls and answering questions during the seminars I do, I am often asked about lauan as an underlayment, and I

spend a lot of time telling people why I think there are better alternatives for resilient flooring underlayment. The name lauan (pronounced *lu-on* and sometimes spelled luan) comes from trees found in the Philippines but has become a generic term in the United States for imported tropical plywood – some

from Southeast Asia and some from Central and South America. I hesitate to use the word “plywood” for some of the luan I have seen because it’s more like two layers of wood with a layer of some kind of hardened wood pulp in the middle. I am sure some of the product that’s out there may be adequate as an underlayment but there is also a lot of junk out there and as more and more installers, homeowners and builders go to the big home centers for flooring supplies, and buy the least expensive product on the shelf, I grow more worried that the quality of what is being sold as “underlayment” has never been worse.

When I started in the industry in the 1970s, the most common underlayment was hardboard underlayment such as Masonite™ and other brands. By the early 1980s, the industry moved away from hardboard because of major problems with joint telegraphing, and lauan started getting used a lot. Back then I was a flooring retailer and we sold a lot of fully adhered sheet vinyl over wood subfloor systems that had old floors down. Rather than tear up old floors, we installed a lot of underlayment and I don’t recall many, if any problems with lauan back then. However, as time went on, we started to see problems with voids and joint telegraphing that forced us to have some serious conversations with our supplier to be sure we got the best quality lauan available. For example, the so-called 1/4-inch lauan we were buying came in two different thicknesses – 5.1 mm and 5.3 mm, neither one of which is a full 1/4-inch, but since we were trying to smooth out substrates, we felt the thicker product was better. However, lauan then and today never had more of a warranty that just on the product itself, so if a floor failed we might get a credit for some new boards, but not much else.

During this time, as more vinyl floors were made with vinyl backings, manufacturers started noticing complaints for discoloring floors and through research were able to attribute these problems to lauan due to the oils in the wood having a reaction with the vinyl that caused staining from the bottom up. They also found that this condition sometimes contributed to adhesion problems, not to mention the joint telegraphing caused by thickness variations and indentation problems caused by voids in the plywood or just the softness of the material. That’s when manufacturers started to warn against the use of lauan, to the point where today many manufacturers say don’t use it at all and others have specific warnings about the risks.

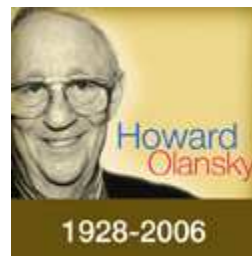
I did a research project for one of my clients two years ago and I was able to find over 20 references against using lauan as a flooring underlayment, from flooring manufacturers and a variety of other sources.



Patching the seams may or may not be necessary when installing plywood underlayment. Check with the underlayment manufacturer to see what they recommend. Photo courtesy of Tarkett.



This condition was caused by over-sanding the joints on a properly installed, properly patched plywood underlayment. Sometimes it’s possible to overdo it! Photo courtesy of Mark Violand.



The Import Plywood Marketing Group, Inc website says, "Lauan or Meranti was never intended to be used as an underlayment for vinyl flooring. It was originally designed as a three-ply plywood for paneling." The National Association of Home Builders said "Typically, 1/4-inch lauan plywood is used as an underlayment when vinyl is installed over wood subflooring. The problem with lauan is that it is soft and susceptible to denting and crushing under concentrated loads such as furniture legs or high heels. Flooring manufactures agree, and Tarkett said, "A wide variety of species and grades of Lauan plywood have been imported into the United States and sold for use as underlayment. Many of these panels have caused severe problems such as discoloration, delamination and adhesion failures." Many other resilient manufacturers have similar statements, so if you are using lauan, the word warranty may not be in the conversation.



The blue tape shows the nailing pattern on this plywood underlayment - nails are almost one foot apart, so the plywood must be re-nailed every 5-6 inches apart and 3-4" on the seams, before the floor can be installed. Photo courtesy of Jon Namba - *FCI* October 2003.

What happened? The lauan we used to use was mostly mahogany, which seemed to be pretty good quality, although it was in limited supply and came from tropical rainforests, which is an environmental concern we won't cover here today. As the better woods became depleted, other types of woods started to be used and the quality went down. I checked with several experts I know to get their opinion on this subject.

I spoke with Mark Violand, a full time floor covering inspector and, with me, an active member of the IICRC (The Institute of Inspection, Cleaning and Restoration Certification) inspector training and certification committee. Mark reminded me of a great column by Bill Baxley right here in *FCI* ("One More

Reason Why Not Lauan by Bill Baxley," *FCI* March 2004). In that column, Mark and Bill told an interesting story about a failure related to lauan. A residential vinyl job where an existing vinyl was covered with lauan underlayment prior to the installation of a new paper/felt/mineral backed vinyl floor covering.



A/C Plywood being installed over an unsuitable plywood subfloor. Photo courtesy of Mickey Moore - *FCI* October 2004.

On the second day of installation, the job was stopped due to the underlayment warping and heaving itself off the old vinyl floor covering. The lauan panels were easily removed leaving the fasteners in place. So what caused the lauan to buckle, heave and warp? Moisture! That's right moisture. Where did the moisture come from? The adhesive. Why did the moisture in the adhesive cause the lauan to swell and heave? Because that's what moisture does to wood, especially the very porous, soft core of lauan.

Reggie Hill of Floor Covering services and consultants has seen lauan as an installer, a dealer, a manufacturer's technical specialist and as one of the most respected consultants in the resilient industry. He told us he "would not even consider lauan for residential or commercial since it is inconsistent in quality, performance and often has staining and discoloration issues from underneath the vinyl."

As Director of Technical Service for one of the leading manufacturers of substrate preparation products, Bruce Newbrough of Ardex fields the calls and sees the problems when it comes to floor prep. "We do not recommend lauan plywood primarily due to the inconsistency in quality that we find. There is simply too much low quality lauan plywood out there to be comfortable that the right grade will be used. Low quality lauan contains rosins that can leach out of the wood and cause discoloration of the vinyl, for which the adhesive often gets blamed."



Fiber reinforced underlayment with cork installed over it.

Wally Ruttgheizer, CEO of Parterre Flooring Systems, has been involved in the commercial resilient industry for decades and said, "Lauan was, at one time, a pretty good underlayment but as the quality went down and other plywood underlayments were specifically developed and warranted for use under resilient, it became obsolete." Unfortunately, the word has not gotten out so lauan is still used on a lot of jobs. "The home centers, lumber yards and even some flooring supply houses," Ruttgheizer added, "continue to sell lauan for underlayment even though there are alternatives that are superior, especially for commercial environments where the floor are subject to a lot of stress and need to be installed

over a solid, stable substrate!"

There are dozens of references that warn against lauan. The good news is that there are other panel underlayments available that are much higher quality. I prefer "real" plywood that is comprised of layers of wood throughout, so there are no voids. My favorite is what is known as "five-ply arctic birch," also known as "Baltic or Russian birch." This is sold under a number of brand names today, and is readily available. There are also some other plywood panels such as the Canadian "Multiply" brand that are made from hard woods and are of excellent quality. These products perform well and have a manufacturer's warranty, which you will rarely see in lauan. You can also use standard "A/C" grade plywood from the lumberyard, but chances are there is no warranty on this type of panel like there are for the other products I have mentioned.



A plywood subfloor is installed directly over the floor joists and is part of the structure of the building. Photo from [www.quiltbus.com](http://www.quiltbus.com).

Regardless of what underlayment you use, make sure it's recommended by the flooring manufacturer for the flooring you are installing and make sure the underlayment recommends it for the end use of the finished floor. For example, if you are doing a commercial job, there may be different requirements than for a residential job.

Some of the products I have mentioned cost more than cheaper underlayments like lauan, but most customers will pay more for a better product with a manufacturer's warranty, so why take a chance?

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*Christopher Capobianco*

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