DRIVE Marine Services

Plywood Idiosyncrasies & Tests

I read in Issue 88 of the problems John Lambert encountered with the transom of his Optimist and I sympathise with him. I thought it appropriate to provide some information on how plywood is manufactured and how you can do some simple tests to minimise the chance of delaminated plywood ending up in your project. As a supplier of plywood, I find it is the bane of my life ensuring we are supplying best plywood available for the price. Due to a shortage of storage space we purchase our plywood as loose sheets and inspect most sheets as they come off the truck and regularly send back sheets due to non-compliance or shipping damage. Even then, we are occasionally caught short. I even had to change suppliers for our cheaper imported Marine Plywood as the outer veneers were so thin they did not comply with BS1088 in most cases and it was easy to sand through the outer Veneers. By the way, they never griped about taking sheets back as they told me they were supplied to a major hardware chain where staff and customers did not know the difference.

I am personally a fan of plywood as it is versatile, extremely strong for its thickness compared to solid timber and enables us to use some exotic timbers that would be prohibitively expensive or lack the mechanical properties in their raw state. The drawback is that plywood is manufactured by manual labour and the quality of the finished item relies on the team involved, getting it right. First there is the Veneer cutting or slicing area where a high degree of skill is required to ensure the logs supplied will provide quality veneers, cut the veneers to tolerenced thickness and know when the cutting blades are becoming blunt to ensure good clean veneers are achieved.

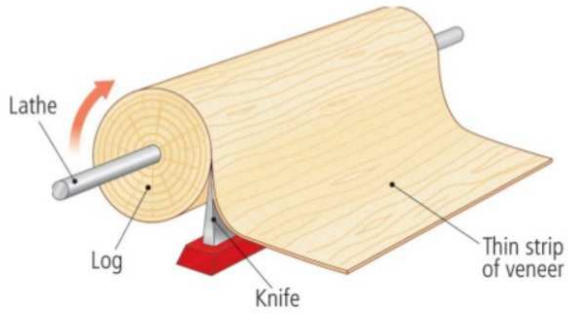

Figure 1 – Rotary Veneer Cutting Plywood

Then the people selecting & laying the veneers need to have the skill to ensure no gaps or overlaps, no loose knots & a maximium of six (6) pin knots per square metre, no open splits, no fungal decay with some other rules thrown in. All of this is achieved, while going flat out to ensure the glue does not go off before the sheets reach the press for final consolidation. Highly skilled jobs, which I am sure most of you would not last long at.

As you can now appreciate, plywood is mass produced and there is always the potential for a small number of defects and non-complaint sheets. Premium manufacturers have systems in place to prevent defects or detect defective sheets and remove them from the production run or downgrade them before they reach the customer. Of course, all of this comes at a price and some people grumble about the cost. If building a boat, it is the cheapest part of the project if you count the cost of your labour. Look how much extra effort John had to put into his Optimist to rectify the problem and he was using a sheet of plywood manufactured to the highest standard available & still got caught out.

Then there is the problem that a Standard is only enforceable in its country of origin, in this case in Great Britain. As a consequence, many Asian mills use the BS1088 stamp as a brand more than as a quality standard. Hence, my earlier statement about taking the time to visually inspect all sheets for obvious compliance or damage issues. I know of one importer who sold off a large quantity of inferior Pacific Maple plywood meant to be Marine grade and I am sure it has made it to a cheapy building materials supplier being sold as Marine Plywood cheaper than we can purchase it from the importer. Those purchasing this inferior plywood are Thrill Seekers and leaving themselves open to delamination issues.

Figure 2 – 4mm Tropical Hardwood Delamination

Okay, so how do we check our plywood for acceptable quality on receipt or during use to ensure we do not have to rework our project as John experienced. There are some simple tests that will usually expose most defects before wasting heaps of time using the plywood received;

1. Check the edge of veneers for splintering or delamination along the grain. If suspect areas are identified, try to force an unsharpened metal paint scraper in between the veneers. If

BEVERLY HILLS NSW 2209 Ph. (O)02 9533 5470 (F)02 9594 4250 Email- Bote.Cote@optusnet.com.au

DRIVE Marine Services

Plywood Idiosyncrasies & Tests

the glue is suspect, it will easily delaminate. Do not use a sharpened scraper or chisel as this will guarantee a stuffed sheet.

2. For suspect sheets place in the sun for a couple of hours to warm up then lay the sheet along its short edge and hold the other end up at eye ball height and check for high spots. This will show up obvious delaminated sections.
3. When cutting the sheet check for splintered edges and carry out the procedure at Step 1. Another way to check for sheets up to six (6) mm thick is to bend the cut section along its length in a reasonable radius (say 300 to 400mm radius over about 2 metres - do not be too aggressive as you will kill a perfectly good piece of plywood). Any delamination will readily show up and badly delaminated ply will probably break if bent too far.

Figure 3 – Cut Plywood showing Delamination Issues

4. The ultimate test for quality of bonding is to take some offcuts (they do not need to be large somewhere between 75 to 100mm [3 & 4"] in size) and place them in a bucket of water for 24 hours to ensure it is absolutely saturated. Then place in the sun and check once the ply is hot as any trapped water will aid in delamination and more than likely show up as blisters in the ply's. Do this a couple of times to be sure and be mindful that this ensures these areas are OK, not the whole sheet. Although, from experience delamination issues usually affect the majority of a sheet as the cause is usually due to glue partially curing before reaching the press.
5. If you want to speed up step 4 put the offcuts into an old saucepan and let them boil away for a few hours. Do not use one of "she who must be obeyed" good saucepans or delaminating plywood will be the least of your worries.

Believe it or not, John was unlucky to come across a sheet of Aussie Hoop Pine with these issues as it would have been manufactured to AS2272 which is the Australian Standard for Marine Plywood manufacture and is the most stringent in the world. I consider Australian Hoop Pine to be the "Rolls Royce" of marine plywoods. I have never seen a delamination issue with Aussie Hoop and in most cases, the Hoop Exterior Plywood outstrips the quality of many imported Marine Ply's from Asian origin, hence its price. For further information on Plywood Standards check out our website @ www.BoatCraftNSW.com.au .

There is now another high quality marine plywood available in Australia at reasonable pricing which is Lloyds Certified to BS 1088. It is Gaboon & Sipelli marine plywood imported from Greece by Marine Timbers and sold by us at DRIVE Marine Services. It is available in 1.5 to 25mm thick sheets and is some of the best plywood I have ever seen. You are welcome to come and have a sticky beak to confirm the quality. Weight is 480kg per Cubic metre and therefore it rivals anything else available for you blokes going lightweight. There is also Teak & Ash Veneered sheets available that are made to the same high standard.

Figure 4 – New 3mm Gaboon Ply Stowage sealed with Clear System

Another word of warning – if getting plywood shipped to you, pay a few dollars extra and get MDF packing sheets as it protects the plywood faces and there is a much greater chance of receiving the plywood without damage. We are pretty good at packing it up for shipment but freight companies are good at playing football or dodgems with it.

If you would like further information on Marine Plywood or want to discuss your requirements, give us a call or send an email and we will gladly support your requirements. If you are unlucky enough to receive a defective sheet of plywood from us we will replace it; do not make do with a sheet that is showing signs of delamination.

Good luck with your building or restoration projects.

BEVERLY HILLS NSW 2209 Ph. (O)02 9533 5470 (F)02 9594 4250 Email- Bote.Cote@optusnet.com.au