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Marine & Exterior Plywood Glue Bond Inspection.

Plywood is a wonderful material, but like all things man made, occasionally things can be less than perfect. No matter where in the world plywood is manufactured and even with the most sophisticated quality systems and procedures the mills cannot achieve 100% pass rate in their bond ratings. The Engineered Wood Products Association of Australasia (EWPA) requires that glue bond samples be taken daily from a production run and that all but a very small percentage must be of the highest strength. Please note that this means that they do allow a small number of poor glue bond strength samples to occur in a batch of plywood and not to reject the batch for that reason.

Mills that produce plywood to a standard must, under that standard, conduct ongoing testing and third party auditing to maintain their stamp of approval. However due to the fact that sheets which have areas with low bond strength or no areas with no bond are hard, and sometimes impossible to detect without destructive testing, these sheets will inevitably find their way into the market. We use the term delamination to describe this fault.

Plywood intended for truly life and death situations, such as aircraft applications can be non destructively inspected and certified sheet by sheet, using ultrasonics, at considerable cost and delay.

For the rest of us, we have to adopt simpler methods. The first thing to understand is that this doesn't happen very often. The second thing is that you can't tell by just looking at the sheet. The third thing is that it is just as likely in a top of the quality range sheet of AS2272 hoop pine marine ply as it is in a sheet of cheap imported almost BS1088 marine ply. The fourth thing to understand is that it might only be a small part of the sheet which is affected.

So what to do.

Cut the sheet up as per normal. Take an off cut, throw it into a bucket of water. Leave it there for 24 hours, then put it in the sun. Do that a couple of times and if it is still intact, then there is no problem with the glue bonds in that off cut. You could also boil the off cut for a few hours to see what happens.

Please understand that these water tests will not damage a good glue bond. If it comes apart it is because the glue bond was unsatisfactory. The water test simply highlights the unglued areas that were already present, which were impossible to see.

Admittedly, this only tests the off cut, not the whole sheet, however our experience is that this will detect almost all of the bond failure situations. Most of the bond faults that we have seen cover most or all of the sheet. You would get further assurance by testing other off cuts from the sheet. They don't need to be big pieces, 2" x 3" (50mm x 75mm) is more than big enough. Alternatively you can water test the actual piece of plywood that will ultimately be used. Please remember to air dry the pieces flat, and remember, water testing may cause some grain to rise which can be sanded smooth again once dry.

If a sheet of plywood does show signs of trouble, just give us a ring and we will replace the sheet without question.