PalletLink Datasheet

www.palletlink.co.uk

Ref: 56n

Pallet deck issues payload damage from protruding nails

Occasionally product damage arises either from acute product sensitivity to splinters, or protruding nail heads usually due to errors in deck assembly. With any customer complaint always check the significance of damage in terms of numbers since only one or two pallets may generate a complaint, do not condemn a whole batch or a particular design. Avoid this by only shipping nail-flush pallets or with visible overdriving.

The typical target for pallet manufacturers is summed up by the CP1 to CP9 specifications as follows: *Fasteners shall not protrude above the surface of the board. Nail heads shall be countersunk (overdriven) between 2 and 4 mm below the surface of the board.* In subsequent remedial action should this not be met, their proposal is that - *protruding nails should be hammered flush*. However, recognise that is often not possible with larger nails after drying has taken place.

Wood shrinkage over a period of time is a common reason that causes protruding nails. It is unlikely that short term (a few hours) kilning such as HT phytosanitary treatment will cause noticeable wood shrinkage, but a day or more in a drying kiln will cause timber to shrink particularly some wood species like wet aspen or fast grown spruce at high starting moisture content. Also pallets stored by a customer will dry over a period of weeks. Three types of damage causes are described: 1. Drying, 2. Popping and 3. Clinching:

1. Drying of joints into blocks or bearers. If a batch of timber was undried at assembly there will be shrinkage. Worst example is blocks of wet aspen or fast grown spruce, expect 4mm measured over the full block height. The boards would shrink around a further 1.5mm in thickness. In a 100mm block only half the block shrinkage would show above deck (the ring nail anchors near the block centre) so we have cumulative 2mm, plus 1.5mm for total of 3.5mm potential nail head protrusion above deck. Overdriving (para 2) at assembly normally takes out 2 to 4mm of this shrinkage. So although normal shrinkage in spruce or pine would be held down flush with the surface, some wet wood, or high shrinkage species may give a nail-head protrusion issue. Certain manufacturing sources are more troublesome eg. if a batch of Euros were made of a species with known tendency to shrink such as Italian Euros made of aspen/poplar.

2. Popping due to poor nails. Plain nails or badly rolled smooth ring nails might have been used with low withdrawal resistance. Either type can ease out (pop) when a loaded pallet is lifted and sit above the deck surface. It is unusual for well made white pallets, Chep, LPR rentals or exchange Euros to pop nails and cause damage. Another batch might be fine. If possible check if sharp profile ring nails were actually used.

3. Clinched nails. Pallet suppliers use nail guns/machines for deck to stringer-board joints in a pallet mat assembly jig. A pallet mat preassembly has fixed steel clinch plates under the nailing area using nails which are a few mm longer than the combined thickness of timber (board + stringer). A problem occasionally is that the points of the nails do not want to clinch over, but instead seem to want to cripple the nails. The nail points then protrude from the underside of the stringer and the points look like they have just hit a 'dead-end' rather than being bent over on the steel plate to run along the surface of the wood. This sometimes results in a popped nail on the deck surface. Although nails may have a sliced-point, sometimes the nail points seem to be too stiff, which stops the point from turning at 90 degrees and running along the surface of the wood. The clinch nail (steel) specification needs to be softer than straight ring nails which are not being clinched.

Popping pop underdriven clinching clinching protruding nails proud nail heads