



# The Expert >>

## Crack Repairs >>

In the last article, I discussed the likelihood of finding cracks in warehouse floors. Like it or not, they are a feature of floors that we have to live with - although they should be the exception rather than the rule. So what do we do about them? The first thing to appreciate is that they must not be ignored. They could be indicative of a structural problem and this possibility needs to be eliminated or monitoring started. The majority of cracks will be of no structural significance but they could affect the running of the warehouse over time.

The problem with cracks is that they break down at the surface of the floor. This breakdown is mostly caused by the passage of trucks. Counterbalance trucks tend to be less aggressive as they have larger tyres with lower pressures. Reach trucks create more damage, with pallet trucks probably being the worst offenders. Their small hard wheels create very high localised loads causing the edges of cracks to break down. See Picture 1.

Cracks need to be repaired before too much damage occurs. The difficulty is that cracks start life as too fine to repair and then get wider as the floor shrinks in the first one to years. So no easy answer here, repair too early and you will have to do it again as the crack opens further, repair too late and damage might have been done. When to act is therefore a matter of careful judgement. However, all floors should be monitored on a monthly basis up until 2 years and all repairs to



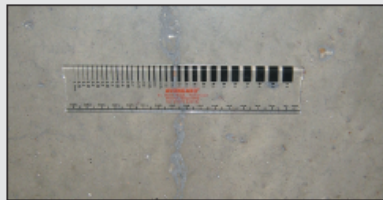
shrinkage cracks should be completed at 2 years.

For fine cracks of less than about 1 mm width, the solution is simple provided that damage is not too advanced. The cracks can be filled with a low viscosity resin. Most fine cracks do not penetrate to the full depth of the slab and filling is relatively straight forward, although time must be allowed for the resin to soak in and then be topped up as many times as needed so that the crack is finally filled. The primary requirement for a non moving crack is for the repair at the surface, not the crack at depth. The resin should be allowed to flow around the commonly found "islands" found along the cracks. See Picture 2.

Very fine cracks of less than about 0.3 mm are difficult to deal with as even the thinnest resins will not penetrate. Some of the wider crazing can come into this category. Most such cracks do not cause problems, if they do start to deteriorate or if appearance is important, then they can be filled with an acrylic or similar surface hardener. The cracks will not disappear but such treatment will prevent the ingress of dirt. It is the dirt in cracks that make them look worse.

It may come as a surprise that very fine cracks can be more of a nuisance than the wider ones. I have seen a number of heavily reinforced floors on piles where the reinforcement creates lots of very fine cracks distributed uniformly over the floor - which is what reinforcement is intended to do.

Wide cracks over 1 or 2 mm are often a sign of



problems such as ground settlement. They could also be larger than usual shrinkage cracks perhaps associated with jointless construction or where joints have failed to open. In these cases, the crack might become the joint. These situations are difficult to manage.

A crack should not be a joint unless it is a planned crack under a saw cut. Cracks that open and close, in response to temperature variations, cannot be rigidly repaired with resin based products and softer fillers are poor at supporting the sides of the crack and preventing damage. There is also likely to be a loss of load transfer across the crack leading to vertical movement as trucks pass. Therefore, there are no easy answers here and it might be necessary to remove and replace a strip of floor and to provide a new additional joint.

Here is one important piece of advice. Do not be tempted to overcoat the floor with paint, resin or any other product. In most cases, you will not hide the cracks, even if they seem to be effectively repaired as the smallest of movement will cause the coating to crack. Also, coatings are rarely as durable as the concrete underneath so all that you will do is create another ongoing maintenance problem.

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