

## Avoiding Surface Imperfections in Concrete

### IMPORTANT SAFETY INFORMATION

When handling and using cement or fresh concrete, avoid skin contact. Wear suitable protective clothing.

### Cement and Concrete Association of Australia

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## Flaking Floors

### WHAT IS FLAKING?

Flaking is where discrete pieces of the surface become detached leaving a rough indentation behind. The pieces are usually flat, hence the name 'flakes'. Scaling should not be confused with flaking. Scaling is delamination of the concrete surface when exposed to freeze-thaw cycles and although the appearance is similar the mechanism is different.

### WHAT CAUSES FLAKING FLOORS?

Flaking is caused by inappropriate finishing techniques that seal the surface and trap the water which would otherwise have risen to the surface as bleed water. This water accumulates below the surface forming a plane of weakness and resulting in delamination of the surface layer.

Premature sealing of the surface can be caused by:

- Commencing finishing too early because the ambient conditions dry the bleed water from the surface and the lack of sheen suggests that bleeding has finished. Note that some finishing tools more than others tend to seal the surface, eg a hand strike-off with a magnesium straightedge tends to seal the surface while a strike-off with a wood or magnesium bull-float pass leaves the surface open<sup>1</sup>.
- The use of driers on the surface to absorb bleed water.

### PRACTICES TO MINIMISE THE OCCURRENCE OF FLAKING FLOORS

To minimise the incidence of flaking:

- Specify air-entrained concrete as these concrete have slower bleed rates and have been shown to be less sensitive to the use of particular finishing techniques than non-air-entrained concretes<sup>1</sup>.
- Avoid the use of finishing techniques that tend to seal the surface, eg a hand strike-off with a magnesium straightedge<sup>1</sup>.

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- In summer, use an evaporative retarder to prevent rapid surface drying and give time for the bleed water to rise to the surface.
- Use wind breaks and, where practical, shade the surface to minimise the incidence of rapid drying of the surface.
- Don't commence finishing the surface too early. Wait until bleed water has stopped rising to the surface, ie when the sheen disappears.
- Avoid the use of driers, especially neat cement, to mop up the bleed water.
- When using dry shakes to provide a coloured surface, exercise caution in their application to avoid them behaving as driers.

#### REPAIR OF FLAKING FLOORS

Repair of flaking floors is difficult and it is best to avoid or minimise the incidence of the problem by using the techniques outlined above.

Recommended repair techniques are:

- Grind the delaminated areas back to sound concrete and apply a proprietary sealing compound.
- Remove the delaminated concrete and apply a bonded topping or epoxy coating to the floor.

#### REFERENCES

- 1 Suprenant, B A and Malisch, W R 'Sealing effects of finishing tools' *Concrete Construction* September 1999, pp 39–43.

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