



## **Durability and Maintenance**

When supplied and installed in accordance with the manufacturer's specifications and design parameters, the SPEEDFLOOR suspended concrete floor system can be reasonably expected to meet the performance criteria set out in the building codes for a period of 50 years.

### **Serviceable Life**

Speedfloor is a composite floor system using both steel and concrete. The two elements must be treated and maintained separately.

### **Speedfloor Steel Joist Maintenance**

The roll-formed joist and perimeter channel is manufactured from steel coated with either 275g/m<sup>2</sup> or 450g/m<sup>2</sup> of zinc. If they reside in a clean and dry environment they will require no maintenance. If they are exposed, they will require a minimum of maintenance to ensure the expected performance is achieved.

#### **Guidelines for this maintenance are;**

- Keep surfaces clean and free from continuous contact with moisture, dust and other debris.
- Periodically inspect for any signs of surface corrosion. Remove any by-products of the corrosion by mechanical means and spot prime the exposed steel substrate with an approved steel primer. Repaint the area using an appropriate paint manufacturer's recommendations.
- All cut edges will initially form a dark red by-product which will in time change to black and then to grey. This is not surface corrosion and is not detrimental to the performance of the product. It is simply a sign that zinc migration is taking place.
- Exposed product situated in a highly corrosive environment e.g. Coastal, heavy industrial etc. it is recommended the product be rinsed with potable water on a regular basis
- For general cleaning of bulk contaminants the use of a low pressure wash (Gurney) with pure water in conjunction with a car or truck wash can be effective. However it's important to rinse the steel with fresh water after cleaning.

### **Concrete**

Special attention is paid to the concrete mixture and the placement of the concrete in the Speedfloor system to minimise the likelihood of shrinkage cracks occurring during the initial curing period. The slump is specified at 60mm and a super-plasticiser is used to improve workability during placement. At times an early shrinkage fibre can be added to the concrete mix to help control plastic shrinkage and a curing compound is used to help control the curing process.

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### Specifications

Zinc coating Weight – 275g/m<sup>2</sup> (Z275) or 450g/m<sup>2</sup> (Z450)

Complying with – AS 1397:2001

Steel grade – G250, G300, G350, G450

Steel thickness range – 2.9-3.0 mm

Bend diameter – G250, G300 ≥ 2T. G450 ≥ 4T.

### Australian Building code Parameters

The Building code of Australia Volume 2 sets out the following requirements for coatings of steel frame products.

	Area 1	Area 2	Area 3
Where in the building	Within building envelope	Outside the building envelope	Where 1 and 2 do not apply
	More than 300 metres from breaking surf	More than 1 km from still water	
	and	and	
	Not in a heavy industrial area	More than 10km from coast with breaking surf	
		and	
		Not in a heavy industrial area	
	Minimum Z275 or AZ150	Minimum Z275 or AZ150	More than Z275 or AZ150

**Note. The building code envelope is deemed to be a space in the building where a steel frame does not have direct contact with the external atmosphere, other than for normal ventilation purposes. Areas not within the building envelope include floor framing members where there is no continuous perimeter subfloor walling.**

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## **Galvanized Steel**

Galvanizing generally refers to hot-dip galvanizing which is a way of coating steel with a layer of metallic zinc. Galvanized coatings are quite durable in most environments because they combine the barrier properties of a coating with some of the benefits of cathodic protection. If the zinc coating is scratched or otherwise locally damaged and steel is exposed, the surrounding areas of zinc coating form a galvanic cell with the exposed steel and the coating essentially re-seals itself. Even for large areas the surrounding zinc continues to significantly impede corrosion of the base metal. This is a form of localized cathodic protection - the zinc acts as a sacrificial anode.

Because the galvanized coating is metal-lurgically bonded to the steel, under no circumstances can moisture travel under the coating to create an accelerated corrosion cell.

## **Reaction between Galvanized surface and concrete**

Zinc reacts with wet concrete to form calcium hydroxyzincate accompanied by the evolution of hydrogen. This corrosion product is insoluble and protective of the underlying zinc (provided that the surrounding concrete mixture is below a pH of about 13.3). Research has shown that during this initial reaction period until coating passivation and concrete hardening occurs, some of the pure zinc layer of the coating is dissolved. However, this initial reaction ceases once the concrete hardens and the hydroxyzincate coating has formed.