

3.0 SCOPE OF USE

Dimond Flooring Systems use a roll-formed profiled galvanised steel sheet as a component in reinforced concrete floor systems. The sheet provides both permanent formwork and positive tensile reinforcement in one way reinforced concrete slab construction over concrete block walls, poured concrete beams, steel beams or timber beams, which are subject to environmental limitations referenced to the appropriate grade of material selected.

It is critical to product performance that the loads applied, spans, formwork material thickness and overall slab thickness are designed within the appropriate Limit State Loads and limitations published in this manual.

Before commencing a project using a Dimond Flooring System, the user must refer to the information within this manual and all sections as appropriate, ensuring relevant information is available to the end user. Failure to observe this information may result in a significant reduction in product performance. Dimond accepts no liability whatsoever for products which are used otherwise than in accordance with these recommendations.

The information contained within Flooring Systems is only applicable to Dimond Flooring Systems – it cannot be assumed to apply to similar products from other manufacturers.

USE OUTSIDE THE STATED GUIDELINES

If the need arises to use the Dimond Flooring System outside the limitations and procedures given in this manual or if there exists any doubt on product handling or use, written approval should be obtained from Dimond for the specific project, before the project is commenced.

3.1 DURABILITY

3.1.1 SCOPE

The Dimond Flooring Systems described in this manual are subject to the environments in which they are used and the type of coating used as outlined in detail in this section.

3.1.2 COATING MATERIAL SPECIFICATIONS

Dimond Flooring Systems are manufactured from galvanised coil in grade Z275 i.e. 275 g/m² total galvanised zinc coating weight.

Grade Z275 usually requires a three-month lead time from date of order to supply for all thicknesses and quantities. Other grades of zinc coating are available. Please contact Dimond for guidance.

3.1.3 ENVIRONMENTS

3.1.3.1 GENERAL

The durability of galvanised zinc coated products is dependent on:

- The environment it will be installed in.
- The grade or weight of the zinc coating used.
- The degree and extent of the maintenance that will be undertaken over the life of the product.

Performance of galvanised zinc coated flooring products is affected by:

- The cumulative effects of the weather to either the underside surface or moisture ingress of the top surface.
- The amount of dust (which can hold moisture) that settles on the product.
- Any other wind-blown deposits that may settle on the product, promoting corrosion.
- Proximity to the ground in subfloor areas with little or no ventilation.

Condensation or other deposits should be prevented from accumulating on the Dimond Flooring System underside by providing adequate ventilation. A protective barrier must be provided if dampness is possible on the underside of the steel flooring sheet. Refer 3.1.5.

3.1.3.2 LIMITATIONS ON USE

The use of galvanised steel flooring sheet should be avoided:

- In areas where high concentrations of chemicals are combined with a high humidity, unless an appropriate protective coating system is applied to the underside surface and fully maintained for the design life of the structure. In this situation the system remains wet for long periods of time, causing a rapid consumption of the galvanised zinc coating and eventual red rusting of the base metal.
- Where the galvanised surface is being exposed to continuous moisture, without a chance for the surface to dry out, unless an appropriate protective coating system is applied to the underside surface and fully maintained for the design life of the structure. For example, where used as the cover slab of a water tank.
- In or near marine environments, where the prevailing wind carries marine salts, unless an appropriate protective coating system is applied to the underside surface and fully maintained for the design life of the structure.
- In areas surrounding chemical or industrial storage buildings where any chemical attack may lessen the life of the structure or wind-driven chemical fumes may attack the galvanised coating, unless an appropriate protective coating system is applied to the underside surface and fully maintained for the design life of the structure. Please call 0800 Roofspeak (0800 766 377) to discuss.
- When in contact with or laid directly on ground.
- When in contact with timber and especially treated timber such as CCA (copper chrome arsenic) without the use of an isolating material such as Malthoid (DPC) between the timber and galvanised steel flooring sheet.
- When used in sub-floor areas with less than 450mm ground clearance.
- When used in sub-floor areas where ventilation does not comply with NZS 3604 Clause 6.14.

Chemical admixtures may only be used with Dimond Flooring Systems if they are compatible with galvanised steel.

Where the top surface of the slab is exposed to moisture, use of the Dimond Flooring System without an appropriate coating system (which is fully maintained for the design life of the structure) and/or adequate crack control to the top surface of the concrete slab should be avoided. Moisture seeping through cracks which are not effectively sealed or which do not have adequate crack control can combine with oxygen to the extent that corrosion of the galvanised steel sheet may occur. For guidance on methods of protection refer to Section 3.1.5 Durability Statement.

3.1.4 NZBC COMPLIANCE

Past history of use of Dimond Flooring Systems indicate that provided the product use and maintenance is in line with the guidelines of this manual, Dimond Flooring Systems can reasonably be expected to meet the performance criteria in Clause B1 Structure and B2 Durability of the New Zealand Building Code for a period of not less than 50 years, provided they are kept free from moisture.

Dimond Flooring Systems designed using the Fire Design Sections 3.3.6 and 3.4.6 of this manual and HERA Reports R4-82 and R4-131 as appropriate will meet the performance criteria in Clauses C3 and C4 of the New Zealand Building Code.

Unless noted otherwise in the Noise Control Sections (3.3.7 and 3.4.7), Dimond Flooring Systems designed using this manual that are stated to achieve Sound Transmission Class (STC) and Impact Insulation Class (IIC) of 55 meet the requirements of the current New Zealand Building Code (NZBC) Clause G6.

Where products used in Dimond Flooring Systems are manufactured by other suppliers, compliance to the NZBC should be checked with that product's manufacturer.

3.1.5 DURABILITY STATEMENT

The use of Dimond Flooring Systems is limited to dry and non corrosive environments. It is the responsibility of the designer to assess the durability requirements of the flooring slab. Consideration must be given to minimum concrete cover of the reinforcement and NZS 3101 provides guidance in this area.

Dimond can, for specific job locations, give advice on the performance of the Dimond galvanised zinc coated flooring system. Call Dimond on 0800 Roofspec.

When using Dimond Flooring Systems in areas as stated in Limitations of Use, achieving the required durability of the system is dependent on adhering to the following:

1. For protection of the galvanised underside surface:
 - An application of a suitable paint system to the galvanised surface exposed on the underside of the floor. Specifications for specific locations can be obtained from Ameron Coatings 0800 263 766 or Akzo Nobel Coatings Limited 0800 808 807.
2. Where the top surface requires protection to suppress moisture entering the concrete one of the following methods is needed:
 - Design reinforcement in the slab for "Strong Crack Control" as outlined in HERA Report R4-113 Section 3.3 Control of Cracking and Leaks.
 - Provide the minimum necessary reinforcement in the slab *and* apply a suitable proprietary waterproofing agent (either mixed into the concrete before pouring or sprayed onto the top surface after curing).
 - Provide the minimum necessary reinforcement in the slab *and* apply a proprietary waterproofing membrane.
3. Where the top surface requires protection to prevent moisture entering the concrete one of the following methods is needed:
 - Provide the minimum necessary reinforcement in the slab *and* apply a proprietary waterproofing membrane.
 - Provide reinforcement in the slab for "Strong Crack Control" (outlined in HERA Report R4-113 Section 3.3 Control of Cracking and Leaks) *and* apply a suitable waterproofing agent (either mixed into the concrete before pouring or sprayed onto the top surface after curing).

3.1.6 MAINTENANCE

Dimond Flooring Systems require a minimum degree of maintenance to ensure expected performance is achieved. Careful maintenance can extend the useful life of the Dimond Flooring System.

As a guide the following should be carried out as often as is needed (this could be as often as every three months).

- a) Keep surfaces clean and free from continuous contact with moisture, dust and other debris. This includes areas such as exposed undersides, eg decks or subfloors.
- b) Any surface cracking exposed to possible water ingress is fully sealed. Similarly ponding of water on exposed top surfaces must be avoided to ensure durability requirements are met.
- c) Regular maintenance should include a washdown programme to remove all the accumulated dirt or salt buildup on all the galvanised surfaces with a soft brush and plenty of clean water or by water blasting at 15 MPa (2000 psi).
- d) Periodically inspect the Dimond Flooring System. At the first sign of any underside corrosion, the affected areas should be cleaned down, spot primed and then repainted to an appropriate paint manufacturer's recommendations.

Any cases of severe damage or corrosion must be reported to the design engineer.