

Nuplex & Environmental Coatings

Date - 22nd June 2010

A modern question for all manufacturers is '*how green is your product?*'

Nuplex manufacture seamless resin based floor and wall solutions which are used for sensitive environments where hygiene, durability & long life is paramount. Nuplex systems can be found in areas such as food processing, industrial manufacturing buildings, retail centers, stadia, schools, airports and hotels, as well as a host of other demanding chemical protection areas where the primary function of the coating is to stop harsh chemical products from attacking environmental elements.

The use of resin based floor and wall solutions as a surface coating in the protection of concrete and the environment has several specific advantages:

- Long service-life
- Reduced re- coat requirements
- Self Adhesion to previous coatings
- Hygienic non porous surfaces
- High wearing strength
- High mechanical and chemical strength
- Low maintenance costs
- Improved environmental aesthetics
- Recycle product use.
- Excellent Return for the "Life Cycle cost of Buildings"

Nuplex specialize in the manufacturing of a full range of resin systems, Polyester, Epoxy, Polyurethane, MMA and Vinyl Ester as resin coating solutions can be custom designed for a wide range of purposes to meet a very wide range of requirements.

In accordance with the principles of product selection, ***that the most environmentally friendly alternative should always be preferred***, and Nuplex's commitment to heavily engage with Architects, Designers and Clients providing detailed specifications to ensure the right product is used for the right environment, there are good reasons for using Nuplex Specified resin based surface coatings in environmental projects that are subject to specific requirements in terms of performance and cost.

Protection for Concrete & the Environment

In the construction industry it is possible to achieve significant advantages through the use of the resin surface coatings, these coatings are executed to a high quality standard and allow adaptation of functionality and aesthetic appearance to improve the performance of base concrete structures.

Resin coatings can be applied in very thin layers (100µm) or up to several centimeters in thickness.

Nuplex's floor and wall systems are developed to protect surfaces subject to demanding technical specifications, and where the finished surface should provide both added value as well as environmental and economic benefits in comparison with other alternatives.

Environmental Impact of Resin Floor Coatings During Installation

During installation concerns are occasionally raised on the emissions from resin coatings, tests have been carried out and it has been proven that emission levels are well below Internationally accepted standards of 50ppm (see our Technical Bulletin Chemical Emissions from Flooring Systems for further details)

Confusion can often take place when VOC,s levels and resin coatings are discussed. The VOC 's when listed for MSDS purposes can state between 30-50% VOC (300-500 g/L VOC) however, resin systems when activated polymerize almost in full. E.g. the styrene turns to polystyrene which is a solid and can not be emitted.

Therefore Not Volatile.

Furthermore most high build resin systems are mixed with design aggregates in the ratio of between 1:4 – 1:8 which dramatically reduces the VOC levels, in fact high build screed systems can be particularly used as environmentally friendly products as less than 20% of there make up is synthetic.

For further information about VOC's & Resin Flooring see our technical bulletin Chemical Emissions from Flooring Systems.

Environmental Impact of Finish Floor Coatings

The finished floor systems do not constitute any danger in terms of health or the environment.

High strength and resistance to wear ensure a long service-life and reduce the need for repairs and maintenance decreasing the life cost of the building.

Once a Nuplex floor and wall system has been installed, there are a large number of people able to benefit from an improved working environment, both in terms of health & safety, hygiene and comfort.

Environmental Benefits of Nuplex Systems:

- Our floor and wall solutions are in principle seamless and have a high degree of strength. This means that the surfaces are very easy to clean, and, if our cleaning recommendations are followed, a good working environment can be retained with the minimum use of cleaning chemicals.
- Nuplex Floor Screed systems are developed to utilize recycled & reclaimed aggregates Glass, Granite, Marble, Sand, etc
- The surfaces have a long service-life and are easy to maintain and repair.
- The production and installation work is executed with a high degree of utilization of the material, resulting in a minimum of wastage.
- All our approved licensees receive ongoing training in the handling of Nuplex Systems and dealing with the attendant packaging and waste.

- During repairs/renovation the existing surface provides an excellent substrate for the new layer, and can therefore be reused during the service-life of the building – which ensures long term environmental benefits.
- When the building is finally demolished the resin coating can be used together with the concrete as hardcore material.

Further information on Nuplex Systems can be obtained from our technical datasheets for the respective products at www.nuplexconstruction.co.nz

Waste Handling

Residual unhardened material constitutes hazardous waste and must be handled in accordance with the appropriate national legislation. Unhardened material must not be released in the sewage disposal system or watercourses.

The hardened product is not to be considered as hazardous waste and can easily be discarded with minimal impact on the environment.

The Hardened product be it large scale slabs or chips and scrapes do not dissolve in water and can be land-filled with no risk to future contamination. Alternatively, the waste can be crushed and re-used as hardcore, or incinerated by a licensed plant where the energy from the incineration can be re-used.

Packaging

Nuplex favor trained applicators using bulk packaging rather than individually packed units which creates vast numbers of small plastic and tin pails which invariably end as land fill. Nuplex also re-use drums and IBC,s where-ever and when-ever possible.

Nuplex Research & Development

Nuplex are constantly looking into resin coating advancements, in recent years the advent of our **low VOC & ZV** systems both within our resin coating and resin adhesive ranges have proved extremely popular both with applicators and environmentally conscious specifiers.

Further information on Nuplex VOC & ZV Systems can be obtained from our technical datasheets for the respective products at www.nuplexconstruction.co.nz

Nuplex Quality

Nuplex is certified to ISO 9001 and ISO 14001.

In order to give the greatest possible consideration to the environment and health, Nuplex has implanted the following procedures:

- Nuplex guarantees the safe manufacturing of its products, both in terms of qualitative characteristics and the impact of the environment during product and transportation.
- We have trained and approved specially selected contractors, so that they meet the requirements on installation work set out by the Nuplex Group.

We conduct inspections at the workplaces to ensure that our instructions are followed and that the quality is of the required level.

Green Build

Using the U.S. Green Building Code (USGBC) LEED environmental system standard for designing high performance, sustainable buildings the following are examples of how resin coatings can be fit into sustainable building practices.

USGBC LEED Indoor Environmental Quality Standard EQ Credit 4.1 Low Emitting Materials:

***Intent:** Reduce the quantity of indoor air contaminants that are odorous, irritating and/or harmful to the comfort and well-being of installers and occupants.*

***Requirement:** All coatings used on the interior of the building (defined as inside of the weatherproofing system and applied on-site)*

How Nuplex can contribute

The use of specific / designed Nuplex systems being classified as low VOC or VOC Free will ensure compliance with LEED EQS low-emitting materials.

USGBC LEED Materials & Resources (MR) Category MR credit 1.3: Building Reuse) Maintain 50% of Interior Non-Structural Elements

***Intent:** Extend the life cycle of existing building stock, conserve resources, retain cultural resources, reduce waste and reduce environmental impacts of new buildings as they relate to materials manufacturing and transport.*

***Requirement:** Use existing interior non-structural elements (interior walls, doors, floor coverings and ceiling systems) in at least 50% (by area) of the completed building (including additions).*

How Nuplex can contribute

Nuplex coatings are durable and long-lasting materials, so they may remain on walls and floors when the building finds a new use, reducing demolition waste and the need to raise new structures. If the requirements pertaining to existing building structure and shell are satisfied, then Nuplex Coatings can contribute to this category.

USGBC LEED MR credit 3.1: Materials Reuse 5%)

MR credit 3.2: Materials Reuse 10%

In addition to MR Credit 3.1)

Intent: Reuse building materials and products in order to reduce demand for virgin materials and to reduce waste, thereby reducing impacts associated with the extraction and processing of virgin resources.

Requirement: Use salvaged, refurbished or reused materials such that the sum of these materials constitutes at least 5% (Credit 3.1), or 10% (Credit 3.2) based on cost, of the total value of materials on the project.

How Nuplex can contribute

Existing floor and wall coatings can be easily repaired and refinished back to its original condition, thus minimizing the need to replace or dispose of it. It can also be removed, crushed and used as hard-fill for future projects also ensuring contribution to this category

USGBC LEED MR Credit 4.1: Recycled Content 10%

Post-consumer + ½ pre-consumer (1 point)

MR Credit 4.2: Recycled Content 20%

(1 point in addition to MR Credit 4.1)

Intent: Increase demand for building products that incorporate recycled content materials, thereby reducing impacts resulting from extraction and processing of virgin materials.

Requirement: Use materials with recycled content such that the sum of post-consumer recycled content plus one-half of the pre-consumer content constitutes at least 10% (based on cost) of the total value of the materials in the project. The recycled content value a material assembly shall be determined by weight. The recycled fraction of the assembly is then multiplied by the cost of assembly to determine the recycled content value.

How Nuplex can contribute

Nuplex can incorporate recycled content clae aggregate, glass marble etc into coating designs to ensure contribution to this category.

USGBC LEED MR credit 5.1: Regional Materials 10% Extracted,

Processed & Manufactured Regionally (1 Point)

MR credit 5.2: Regional Materials 20% Extracted,

Processed & Manufactured Regionally (1 Point)

In additional to MR Credit 5.1)

Intent: *Increase demand for building materials and products that are extracted and manufactured within the region, thereby supporting the use of indigenous resources and reducing the environmental impacts resulting from transportation.*

Requirement: *Use building materials or products that have been extracted, harvested or received, as well as manufactured* within 500 miles of the project site for a minimum of 10% (Credit 5.1), or a minimum total of 20% (Credit 5.2), based on cost, of the total materials value*

* *As defined by the USGBC. Refers to the final assembly of components into the building product that is furnished and installed by tradesmen.*

How Nuplex can contribute

Nuplex primary manufacturing takes place in Auckland NZ, with most materials sourced locally.