

NCC's Resin Flooring Site –

www.resinflooringsite.co.uk

Polyurea Resins

This class of resin flooring materials is technically a type of elastomeric resin derived from the original chemical reaction product of a polyol and an isocyanate component through a relatively new process called stepped polymerization. It was only a relatively few years ago in the 1990's that the current type of advanced two-component polyurea resins suitable for flooring and coating systems were first introduced. The rapid and relatively straightforward (with the right equipment!) application characteristics and cure rates, together with their advantages of reduced environmental and handling limitations compared to some established resins such as epoxies and PU materials, made them attractive for many applications – but the limited number of specialist contractors with expertise and experience, plus the restrictive cost of the hot-spray airless equipment, means that it will be some time before the Polyurea resins ever take a major share of the resin flooring market.

This is despite the fact that Polyurea resin floors do have some more distinct advantages and increased performance in terms of their mechanical properties and chemical resistance over traditional resin materials, especially for more demanding area projects. Specifically their fast reaction curing and hardening (significantly better than epoxy resin systems), with relative low sensitivity to moisture (significantly better than polyurethane resin systems), make them very useful protective coating systems. They are also mixed at the nozzle, making them especially cost effective with machine application on large surface areas.

Polyurea systems have already been used in the USA for over 20 years, where large areas quickly made investment in the expensive spray equipment a good option. In the UK and other European countries, their use and market share has been much slower, but is also now growing steadily for the best products (VIP Chemie GmbH Quickcoat range) for many different industrial (bunds and containment lining) and difficult car parking decks and even structural waterproofing applications. Related products are also now widely used for truck beds and the like by vehicle manufacturers in their factories and workshops.

Polyurea Resin Flooring Systems

Advantages of Polyurea Resin Floor Coating Systems

In summary the VIP Quickcoat advanced polyurea Resin Floor Coating Systems are spray-applied, very fast curing, can be applied in thick layers in one application (usually 1 - 5mm) and is touch dry in 5-10 seconds, allowing complete systems to be installed extremely quickly ensuring a rapid return to service. There are a number of important advantages that can be obtained by using these latest Polyurea Resin linings and coating systems that include:

- Rapid curing
- Moisture Tolerant

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- Excellent Adhesion
- Environmentally Friendly
- High Abrasion Resistance
- Excellent Heat Resistance
- High Tensile Strength
- VOC, plasticiser and heavy metal-free
- Extremely durable

Disadvantages and Limitations of Polyurea Systems

Some of the beneficial properties offered by polyurea elastomeric coatings can also pose some issues that may be a disadvantage for some projects such as:

- Application can be nozzle operator dependent and must be monitored closely.
- Fast curing can mean insufficient 'wetting' of the substrate is a risk.
- Tolerant of damp, but not 'wet' surfaces so good Quality Control required.
- Polyurea requires specialist application techniques and expensive equipment.
- Designed to be protective rather than aesthetic, so the finish can have an 'orange-peel' effect and in UV light they can discolour.

Therefore considering all of the above advantages and for the prevention of any issues on site, getting the right advice and support from the polyurea specialists at NCC Resin Flooring is an essential pre-requisite for successful completion.

Application Requirements and Characteristics of Polyurea Resin Floors

Substrate condition - the concrete substrate must be sound and of sufficient compressive strength (minimum 25 MPa), with a minimum pull-off strength of 1.5 N/mm². Any unsound or damaged concrete must be removed and repaired, plus any surface defects must be fully exposed and repaired with suitable compatible products.

Moisture content - Prior to application of polyurea resin systems the substrate moisture content must be < 4% , the relative humidity should also be checked and recorded, so that dew point conditions can be avoided. If the moisture content is more than > 4%, then application of the polyurea coating can only proceed when the moisture level reaches an acceptable level, or a temporary moisture barrier such as Sika EpoCem technology, is applied and then the work will be able to proceed the next day, once this barrier layer has hardened sufficiently.

Substrate Preparation - Concrete substrates must be cleaned and then mechanically prepared using abrasive blast cleaning for example, to remove any cement laitance, existing coatings and to achieve a fine gripping profile that is clean, dry and free from laitance, dirt, grease, oil and any other form of surface contamination.

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Application - Polyurea systems require installation by trained and experienced contractors as in the end, the person at the spray gun is mostly responsible for the quality level that is achieved, which is why the whole process must be monitored. The selected contractor's operatives must all be adequately trained and instructed in a project specific Quality Control process that will lead to the best possible results.

The specialists at NCC can advise you on the most suitable polyurea resin systems, trained Specialist Contractors (please also see the 'Specialist Contractors' Page of this website), for your specific bund lining project needs. Please call any of our offices for assistance from our experts.