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CPD Article

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How Resin Comfort Flooring Delivers Soft and Durable Finishes for Industrial and Commercial Situations

Key Learning outcomes

- Reasons for resin comfort flooring
- Typical resin comfort flooring systems
- Application of resin comfort flooring
- Surface preparation
- Keys to success

Resin comfort floors marry extreme durability and robustness, yet retain a soft and comfortable finish which is modern and attractive for diverse applications. Designed with footfall and wear in mind the finish is so tough it's suitable for industrial areas as well as commercial and domestic facilities. The range of comfort flooring typically offers a choice of 3 flooring systems providing varying thicknesses with degrees of bounce and flexibility.
These systems are installed by specialist resin flooring applicators. When installed correctly to prepared substrates such as concrete the systems become a permanent part of a building and provide a monolithic long term solution.

Resin comfort flooring is often chosen, and installed, on the basis of the many hygienic qualities provided with the floor system options available. Under normal conditions, due to its smooth finish it is enough to sweep a resin comfort floor with a basic brush cleaning regime.

The systems are watertight and impervious so if there is any dirt and deposits on the floor then a standard wet cleaning regime with a mild detergent is all that is required to maintain the beautiful finish the same as when the floor was laid.

1.0 The reasons for resin comfort flooring

Where footfall occurs resin comfort flooring finishes are good for the back due to the soft impact effect. With many traditional hard floors, regular users can find they experience difficulties with back issues from walking on an unyielding surface. The soft finish with comfort floor systems provides sound absorbing ergonomics, improving the acoustic properties of the building and reducing acoustic impact on other areas of the building. The performance of comfort flooring has the benefits of cushion vinyl but with the additional benefit of providing a seamless hygienic floor.

Generally, the thicker the floor, the more resistant the floor is to heavy wear. But sometimes a hard floor such as a tile can be prone to chipping and pitting from impact damage because of its brittleness. Resin comfort flooring delivers thickness for strength but because of its soft finish it has excellent resistance to sharp objects, impacts, shocks and dropped objects, minimising the chance of remedial repairs being required.

Technical performance
Flexibility: The flexibility and bounce of a resin comfort floor can be stated by using measurable data such as shore hardness (A or D), tensile strength, elongation at break and noise reduction in decibels (dB). This performance will be much greater in terms of flexibility and noise reduction than normal self smoothing resin systems which are formulated set or cure to as hard a finish as possible, making them more brittle. A multi-layer resin comfort flooring system could achieve a shore A hardness of 80 and have noise reduction performance up to 20dB. So with comfort flooring where a heavy item is dropped or where there is impact from a heel the soft finish will allow for a slight initial indentation to occur but the floor system will recover and the sound will be greatly reduced.

Bond Strength: Resin comfort flooring systems have superb adhesion to become monolithically part of a concrete substrate and they are impervious with excellent wear resistance and impact resistance. The bond strength is so good that when tested for adhesion the concrete substrate will fail before the polyurethane screed does. A bond strength of >3 N/mm2 is achieved in line with BS EN 13813 testing which confirms substrate failure will occur before the resin flooring does.

Water Permeability: The water absorption of polyurethane resin comfort floor screeds is nil meaning they provide an impervious surface.

Resin comfort flooring installed in a commercial situation subject to busy use

2.0 Typical resin comfort floor systems

Single body coat of polyurethane self smoothing resin

A single application of polyurethane self smoothing resin body coat provides a hard wearing finish with a degree of flexibility creating a soft finish and crack bridging properties. Installed at 2-4 mm thickness this is recommended for industrial and commercial areas subject to normal traffic. The system has a high wear resistance, high chemical resistance and medium resistance to shocks. The floor is suitable for dry areas such as schools, laboratories, corridor areas, electronic companies and health care facilities, etc

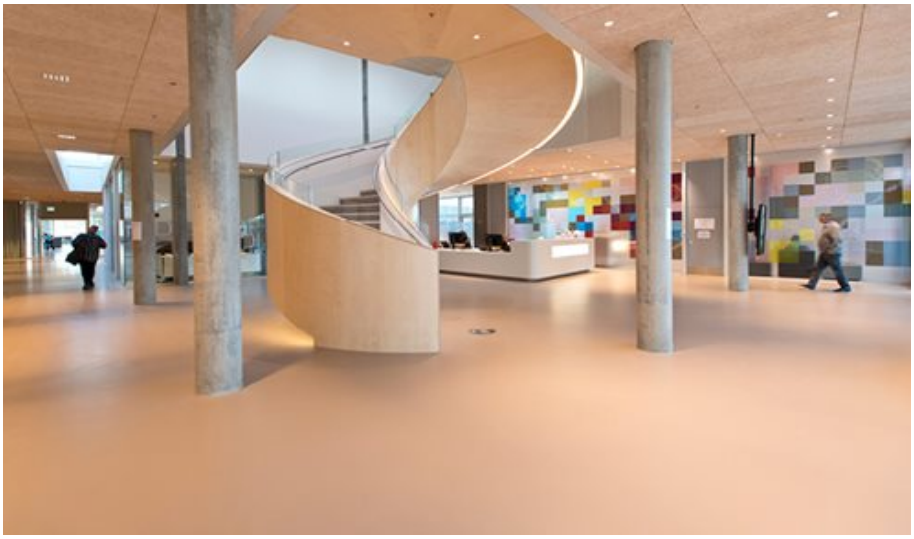
Multi layer resin comfort flooring

Full functioning resin comfort floor systems with maximum noise reduction generally obtain their bounce and resilient properties from an initial flow applied membrane installed at 5-7 mm thickness. This then has a ‘body coat’ applied which is typically a flow applied self smoothing material installed at 2-4 mm thickness. These are both two-part polyurethane based products. The body coat may or may not be UV stable according to the formulation. Non UV stable grades would normally be sealed with a UV stable top coat which also enhances scratch resistance and ease of cleaning. Installed at 7-10 mm thickness this is recommended for industrial areas subject to heavy and intense traffic. The system is impact resistant and sound absorbing, and is therefore suitable for dry areas as schools, laboratories, corridor areas, electronic companies and health care facilities where sound dampening properties are required.

Multi layer sports comfort flooring

For sports facility comfort flooring a thicker membrane can be installed with the same body coat applied on top as for standard comfort flooring. This creates more bounce and even higher comfort level.Installed at 8-10 mm thickness this is recommended as a combi-elastic sports floor system with excellent bounce and comfort due to the soft and resilient liquid polyurethane membrane. The floor offers very high comfort and safety level and is very durable and capable to withstand high mechanical stress. The floor is therefore recommended for sports facilities, schools, dance halls, playgrounds and fitness centres and other areas where shock and sound absorbing properties are required, such as laboratories, corridor areas, electronic companies and health care facilities where sound dampening properties are required.

All these systems provide a monolithic permanent solution as a floor finish which should not create future landfill waste. This long term performance and the use of natural oils contributes to the sustainable properties of this flooring.



Resin comfort flooring installed in a hospital for durability and sound reducing performance

3.0 Application of resin comfort flooring

Following surface preparation a single coat of solvent-free polyurethane primer is applied by squeegee and roller at a rate of around 0.3kg per m2. The the self smoothing membrane is applied if required followed by the self smoothing body coat. Resin comfort flooring being self smoothing is one of the fastest ways to lay a flooring system and to create a beautiful and durable foundation that completes a construction or refurbishment. Over 500 square metres can be applied in a day. Once subsequent resin comfort floor layers are applied traffic can be received after only 24 hours.

The membrane and body coat products highlighted in the comfort systems use polyurethane technology to create medium viscosity 2-pack materials with a base resin and hardener which area very flowable and easy to apply by trowel, squeegee and spike roller. Being 2-pack these materials are easier to install than traditional epoxy self smoothing resin systems which are 3-pack with a base and hardener and also an aggregate component. Each application of primer, membrane and body coat will cure overnight so products are installed on consecutive days to achieve maximum inter-coat adhesion. The floor systems shown should be installed by specialist approved resin flooring applicators.

The polyurethane membrane and body coat screed formulations are completely free of solvents and include natural plant oils, contributing to environmental standards across Europe such as LEED V4 and BREEAM. The floor systems are very flexible, free of joints and seams, which can hide dirt and bacteria, and this also prevents the flooring material from crack forming from vibration and heavy duty wear. The materials are classed as non-hazardous because they have low VOC content. They are chemicals however and manufacturers supply Safety Data Sheets, SDS, which detail standard procedures utilising Personal Protective Equipment, PPE, such as gloves and eye protection.

Modern decorative designs are also possible with resin comfort flooring by combining two of the shades from a colour range available to create stylish surface marbling in the finish. This can be subtle with two shades of grey to provide a contemporary urban look or it can include contrasting bright colours for a dazzling loud finish.

Resin comfort flooring is designed to deliver performance and great aesthetics in all sectors, including hospitals, school buildings and offices, to shopping centres and sports areas, and also to industry where heavy wear and tough industrial treatment can occur.

Resin comfort flooring installed in a school with a two shade ‘marble’ finish

4.0 Surface preparation

Preparation is essential to ensure a long term solution and to establish the degree of adhesion or bond strength mentioned previously where the bonding exceeds the strength of a concrete.

The most common method for large projects is vacuum shot blasting where steel shot is fired at a surface to create a an ‘orange peel type’ texture. This is widely used for large, flat areas of flooring, texturing the surface area to increase adhesion and penetration. Steel shot is fired at the surface and re-circulated, stray shot is collected by magnetic rollers and debris vacuumed away. A rough, sandpaper-like texture is created. Typically around 600 – 1000 m2 can be vacuum shot blasted per day. Smaller machines can be used for edges and confined spaces.

Other methods of substrate preparation include Diamond Grinding which is often suited for lower-build or thinner applications. Industrial diamond tipped discs create a lower profile texture finish compared to shot blasting. This method can also be controlled under vacuum.

Resin flooring systems are suitable for any cementitious substrate such as concrete if it is sound and strong, ideally with a minimum compressive strength of 25N/mm². Other substrates such as wood and metal can also be laid onto if adequately prepared. Metal surfaces should be abraded with zinc primer applied. Wooden surfaces should be sound and continuous, so when going over floorboards these should first be overlaid with plywood with the joints sealed and taped. Going over existing floor systems such as tiles, vinyl or lino is best avoided with this being removed as these can de-bond and fail. These should preferably be removed first to establish a sound substrate underneath which would usually be concrete. If tiles can be established as being very soundly bonded and the surface can be abraded resin flooring systems can be overlaid where its preferred not to remove the tiles.

Where a substrate is heavily contaminated or needs to hot hard with abrasive equipment scabbling processes can be used where tungsten flails are used to create a rougher textured profile. This textured will be great to enhance adhesion and if a screed thickness is being applied to hide the heavy textured surface. A thinner coating type system might not cover this profile so a cementitious sub-screed may have to be installed to establish a suitable smooth substrate. Otherwise texture would still be apparent within the finished resin floor.

Resin comfort flooring installed on a smooth prepared concrete substrate

5.0 Keys to success

System guides can be provided as an overview on the purpose of a particular system showing benefits and the scope of use. An outline specification is provided with details on preparation and each stage of application for the floor system making these comprehensive documents for specifying and application purposes. High performance floor system guides are all available through the RIBA sites along with case studies and product brochures.

Preparation is always essential and involves specialist professional equipment.
The installation of resin flooring products is a professional job which should only be done using experienced dedicated resin flooring contractors.

Manufacturers work closely with nationwide approved contractors. This can be a vital part of a manufacturers service to ensure an appropriate contractor is used for each project who has the expertise, experience and the skilled labour force to progress applications from start to finish.

It is always essential to consider the cleaning regime for an area to make sure the floor finish specification will be appropriate for an area. If an area is mainly just being swept and only occasionally deep cleaned it will need a smooth finish to allow for this. Usually in industrial and commercial facilities however a proper cleaning regime is in operation. Having invested in a resin floor system to achieve the maximum lifespan it is recommended that a cleaning regime is employed to get the best from the investment whether it is a new build project or a refurbishment project. It is not unusual to find that the previous cleaning method, materials and processes are no-longer effective or acceptable or do not achieve the level of cleanliness that is now being required of the floor area. Cleaning in production facilities may include a combination of mechanical processes and chemical processes.

Resin comfort flooring installed in a school cleaned and maintained for a great aesthetic finish