

The Importance of Preparation When Installing a Resin Flooring System in the Food Industry



Most clients in the Food Industry who order a performance resin flooring system are surprised at the thoroughness and complexity of the preparation work undertaken prior to installation.

A number of clients question the cost and effect on programme that a comprehensive preparation of the sub-floor can levy, but few realise the vital importance of this activity.

All sub-floors are different, especially older floors with previous use. A thorough investigation of the sub-floor specification and the history of usage is essential. In addition, a detailed inspection of the surface for tell-tale signs of structural issues is of equal importance.

There is no doubt that all clients want super long term durable resin floors which will perform under their operating conditions.

The main purpose of surface preparation is to provide a sub-floor surface which is structurally sound, clean and free of contaminants which could either affect the adhesion of a resin floor (oils, fats, greases, water dampness) or affect the chemical curing or the resin primer or screed (acids, alkalis and bleaches used in cleaning regimes).

The other main purpose of surface preparation is to achieve a surface profile which will provide a mechanical key and allow some surface penetration if possible.

The mechanical key is a measure of the roughness, openness or texture of the sub-floor surface. A suitable mechanical key should be quite easily achievable through a variety of preparation procedures.

The vast majority of sub-floors which are to be overlaid with a resin based flooring system are concrete. Other materials regularly have resin based floor finishes, such as steel decking and timber floors. But, for the purposes of this article we will concentrate on the correct approach to concrete sub-floors.

If new concrete floors are part of a flooring project, correct specification of the concrete is of paramount importance. Thickness of slabs, effective D.P.M's, strength of concrete used, type and level of reinforcement as well as surface finish (powerfloat) and surface tolerance are all vital considerations.

Experienced resin flooring manufacturers and installers can help with concrete sub-floor specifications to achieve overall success.

Choosing the Correct Method of Preparation

There are a number of preparation methods and a vast array of equipment at the contractors' disposal. Most projects will utilise a combination of methods and equipment.

Vacuum Assisted Shot Blasting

For installation areas generally of 150m² and over, the most speedy and efficient method of surface preparation is vacuum assisted shot blasting. This system is fully enclosed and propels a variety of (usually) steel shot at the concrete surface at high velocity. The shot blasting equipment is designed to re-circulate the shot but to extract all the concrete dust and debris which is created by the surface impact, away to an industrial sized vacuum positioned closely to the main machine. Vacuum assisted shot blasting provides an excellent and uniform mechanical key whilst simultaneously removing surface contamination and any laitance from the concrete surface.

As mentioned above, the size of the installation together with the accessibility will determine the practicality of using this preparation method. The equipment is normally brought to site on the back of a lorry which also houses a powerful diesel generator which in turn powers the shot blasting machine and industrial vacuum unit. The ability to offload the lorry or reverse on to a loading dock is essential as is the ability to drive or transport by forklift truck the equipment to the workface. Width and height of door openings becomes a consideration when contemplating the use of this type of equipment.

The benefits of using vacuum assisted shot blasting are speed (a concrete surface area of between 500 – 1000m² can be prepared in one working day).

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The set cost of this operation and the possible travelling time involved by the operating crew will determine the cost effectiveness of using this type of preparation service.

Obviously vacuum assisted shot blast treatment is very cost effective on larger areas but can work out to be expensive in small areas with less accessible geographic locations.

Although various types and sizes of shot are available, this preparation procedure will leave a varying profile on the concrete surface which is of no relevance where trowel applied resin systems of 2mm thickness or greater are to be installed. However, thin resin coatings or sealers will show any shot blast profile or "tram lining" where machine passes overlap which may not be acceptable in terms of aesthetics.

Diamond Grinding

An alternative to vacuum assisted shot blasting is heavy duty diamond grinding. Diamond grinding machines vary in size from small handheld units to small to large upright units.

Diamond grinding therefore has greater flexibility in relation to size of installation. All diamond grinding equipment must also be attached to industrial vacuums and all equipment that is used for this purpose has attachment points for vacuum extraction.

A variety of diamond head profiles are available to use with grinding machines which will have an effect on the finished surface profile and the speed of action. Diamond grinding can be used to create a finer textured profile on to a concrete surface which is more suitable for thinner resin coatings and sealers but may need additional profiling with other equipment to ensure the maximum mechanical bond when laying more heavy duty systems.

Scarifying and Scabbling

Scarifying equipment is generally smaller and more manoeuvrable than vacuum assisted shot blast equipment. Scarifying therefore will be the preferred choice of surface preparation on smaller or less accessible installation projects. A typical scarifying machine utilises tungsten tipped star shaped flails which are loosely fixed to a rotating drum, driven by the power source. The rotating drum allows the tungsten flails to impact on the floor surface causing an aggressive, multi-impact profile which is eminently suitable for thicker, trowel applied resin coatings and screeds but not suitable for thin coatings and sealers.

Scabbling preparation equipment is a similar type of preparation procedure but even more aggressive because of the vertical

impacting nature of the tungsten tipped pistons. This equipment is generally run by compressed air from diesel powered compressors sited at a nearby outdoor location. Scabbling is normally only undertaken where a significant thickness of the concrete surface has to be removed either due to deep seated contamination and/or structural surface weakness.

Detergent Washing

An effective method of removing certain types of surface contamination can be detergent washing. Specially formulated chemical detergents have been formulated to address specific surface contaminants such as oil and fat based materials but can also be used to help neutralise acid or alkalis based contamination. A wide variety of equipment can be used in conjunction with cleaning detergents and chemicals. These include high pressure jet wash and rotating scrubbing machines. The additional option of using heat either in the form of hot detergent application or flash steam cleaning can also aid the decontamination process.

It is usually essential that once decontamination washing has been carried out, a thorough rinsing regime is employed to remove all residue. Usually, the substrate must then be allowed to fully dry off prior to further activity.

Detailed Preparation Procedures

In addition to the main line sub-floor preparation procedures listed above, a wide variety of additional, detailed preparation procedures provide important enhancements to the long term success of any installation. Most of the larger and heavy duty preparation equipment will not access floor areas close to walls, corners, under staircases and around plinths and equipment. Handheld diamond grinders and other small pieces of preparation equipment are therefore essential to provide a continuous level of preparation throughout the surface area. In the case of more heavy duty resin based flooring systems of say 3mm thickness and greater, the introduction of toe in grooves is advisable at many locations.

Toe in grooves are basically a U-shaped slot which is cut into the floor using a handheld, double diamond bladed cutting machine which will introduce a toe in groove of suitable dimensions to suit the resin flooring system to be installed.

It is advisable that this detail is installed at all perimeter and division walls, around all day joints, expansion joints and other floor interruptions such as drainage units, plinths, equipment legs, stanchion bases and the like.

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Additional Issues and Side Effects

When considering the method of preparation to a given floor installation, the flooring contractor must also consider the effect of noise, vibration and dust especially if the client's operatives continue to work in close proximity. Effective screening around the work areas can improve matters in relation to dust but noise level, impacting and vibration must be addressed by programming if unavoidable. Similarly, the removal of consequential concrete dust and/or contaminants from the workface must be considered, especially in land locked areas within a food factory. Also the disposal of said debris must be given consideration in relation to the correct health and safety disposal directives which are becoming ever more stringent.

The Long Term Value of Correct Preparation Procedures

The above information presents a daunting array of worrying possibilities to some potential clients. However, sufficient forethought and planning together with well organised execution will result in a timely and effective conclusion to the preparation issue.

This work is unavoidable if a client requires piece of mind in relation to the success of a long term durable resin flooring installation. The consequences of premature failure in relation to loss of production and possibly removal of plant and equipment underline the fact that the correct level of subfloor preparation should never be compromised.