

FERFA GUIDE TO SEAMLESS RESIN TERRAZZO



FeRFA Guidance Note No. 7



1. INTRODUCTION

Resin terrazzo floors provide a durable seamless decorative floor surface with the cleanability, hygiene and chemical resistance benefits of conventional synthetic resin flooring systems. Resin terrazzo flooring is categorised as a FerFA Type 5, 6, 7 or 8 resin flooring system dependent upon the method by which it is created. The FerFA types are shown in the table below:

TYPE	NAME	DESCRIPTION	DUTY	TYPICAL THICKNESS
1	Floor seal	Applied in two or more coats. Generally solvent or water borne.	LD	up to 150 µm
2	Floor coating	Applied in two or more coats. Generally solvent free.	LD/MD	150 µm to 300 µm
3	High build Floor coating	Applied in two or more coats. Generally solvent free.	MD	300 µm to 1000 µm
4	Multi-layer flooring	Aggregate dressed systems based on multiple layers of floor coatings or flow-applied floorings, often described as 'sandwich' systems.	MD/HD	> 2 mm
5	Flow applied flooring	Often referred to as 'self-smoothing' or 'self-levelling' flooring and having a smooth surface.	MD/HD	2 mm to 3 mm
6	Resin screed flooring	Trowel-finished, heavily filled systems, generally incorporating a surface seal coat to minimize porosity.	MD/HD	> 4 mm
7	Heavy duty flowable flooring	Having a smooth surface.	HD/VHD	4 mm to 6 mm
8	Heavy duty Resin flooring	Trowel-finished, aggregate filled systems effectively impervious throughout their thickness.	VHD	> 6 mm

The two methods of creating a resin terrazzo flooring system are:

- a) by applying a conventional resin flooring of Types 6, 7 or 8, but generally incorporating a larger size of aggregate, and then grinding and polishing to a smooth finish, or:
- b) by applying a more fluid resin flooring of Types 5 or 7 and then scattering the aggregate uniformly over the surface, rolling or trowelling to ensure that the aggregate is well embedded in the flooring, and then grinding and polishing to a smooth finish.

Method a) is used most widely but method b) is used in a number of proprietary processes. Both methods can be used with all of the different types of synthetic resin binder.

Terrazzo floors are often specified where aesthetic considerations are paramount, and consequently a very high standard of application and skill are essential in order to meet the specification of the finished floor.

2. DESCRIPTION

Resin terrazzo floors are composed of a mixture of aggregates, bound with pigmented synthetic resin, which after setting is ground and polished to expose the aggregate and provide a smooth, decorative and hard-wearing finish. The resin terrazzo generally incorporates colouring pigments, to provide the background colour. Aggregates such as crushed marble, natural or synthetic stone, plastic chips or crushed glass can be used. Aggregates should be clean and sized between 3 mm and 8 mm for method a) and between 3 mm and 6 mm for method b) and may be used individually or mixed.

NOTE: Apart from the visual effect that is required, the type of aggregate to be used should be selected with regard to the intended performance of the flooring. For example marble aggregates are unsuitable where resistance to acid spillage is required and some glasses are adversely affected by spillage of strong alkalis.

3. SELECTION CRITERIA

Before specifying or commencing with the installation of resin terrazzo flooring, a number of key factors should be determined to ensure the correct selection is made.

3.1 Surface Regularity of the Substrate

The finished resin terrazzo flooring will follow the general profile of the underlying substrate. Although the grinding operations may reduce some of the undulations in the flooring, it is important to define and agree the surface regularity as per Table 1.

Class	Maximum permissible departure from a 2 m straightedge laid in contact with the floor (mm)	Application
SR1	3	High standard: special floors
SR2	5	Normal standard: normal use in commercial and industrial buildings
SR3	10	Utility standard: other floors, where surface regularity is less critical

In order to minimise wastage and to reduce the amount of grinding necessary, it is preferable to ensure that the concrete base meets the same requirements of flatness and surface regularity as are specified for the finished floor. If the concrete base is not suitable, consideration should be given either to diamond grind the surface flat, or to first applying a polymer-modified cementitious levelling screed, in accordance with BS 8204-3.

The quality of the concrete substrate or cementitious levelling screed and its method of preparation should meet the requirements of Section 7 BS8204-6:2008.

3.2 Thickness

Grinding and polishing can remove 2 mm or more in thickness, depending on the flatness of the flooring as it is first applied. This must be taken into account when designing the floor to ensure that the finished resin terrazzo flooring has sufficient thickness to fulfil all the performance requirements, particularly of durability and impact resistance. Greater thicknesses may be appropriate where the finished floor will be subject to thermal shock or high impact loads.

3.3 Slip Resistance

The slip resistance of a floor in service is dependent upon the nature of its surface. It is important to recognise that this can change over time and in use. Generally resin terrazzo flooring is not inherently slippery in the dry but the combination of very smooth floors and hard smooth heel or sole material can be slippery. Similarly, dry contaminants such as dust, fibres, lint and paper can make dry floors slippery.

Because resin terrazzo floorings are ground to a hard flat surface, slip resistance may be adversely affected if the flooring becomes wet or is subject to contamination by oils or greases. To obtain the necessary degree of slip resistance in wet conditions it will be necessary to accept a coarser final grind.

The flooring should be finished to produce a reasonable slip resistance for the expected use. The PTV (pendulum test value) of the floor surface should not be less than 40 when tested in accordance with the method described in BS 7976-2. In particularly wet areas, the client should be advised of the benefits of the use of special footwear with slip resistant soles, which can allow a smoother floor finish to be adopted. In such situations a PTV in the wet of not less than 33 might be acceptable.

The normal finish of terrazzo obtained by grinding to a fine finish should be suitable for most locations. However, on staircase treads and ramped surfaces the use of prefabricated slip resistant dividing strips in a colour contrasting to the background, set in the resin terrazzo should help to increase grip.

Care needs to be taken in the selection and application of liquid applied polishes to ensure the slip resistance is not impaired.

3.4 Timing

The processes of grinding and polishing can only begin when the resin flooring has achieved sufficient cure to allow the production of a flat surface without undue plucking of the aggregate from the surface. This may depend on the

ambient temperature both during application and the curing period. The grinding and polishing operations tend to be slower than the first application of the resin screed and so can add several days to the installation programme depending on the machine and operative resources available and the volume of material needing to be ground away. This should be allowed for in the installation programme.

3.5 Joints

Movement joints in the concrete base should be carried through the resin terrazzo flooring, this can be accomplished by means of proprietary metal-edged movement joint profiles. These vary in design, but should provide a mechanical key for the resin terrazzo flooring. They can also be used to form joints other than structural ones and should be used around columns, between resin terrazzo and other types of flooring, and centrally over supporting beams and walls of suspended structural floors.

Resin terrazzo floors do not need additional joints but these may be incorporated for visual effect or to delineate particular designs or logos. Purpose designed dividing strips made of corrosion resistant brass, aluminium alloy or coloured plastics should be used to demarcate the areas and the resin flooring should be well compacted into the strip on both sides to ensure maximum contact and the elimination of leakage paths.

3.6 Skirtings and Coving

Surfaces with a curved profile can be created in resin terrazzo but may require a special resin composition having a slightly different appearance particularly if the same size of aggregate cannot be used.

Curved surfaces cannot be ground in the same way and the hand held grinding and polishing operations are inevitably slower than for large open areas. The effect on the programme needs to be taken into account. Preformed sections can also be manufactured in advance to assist in this regard.

4. APPLICATION

The substrate preparation, priming and application processes should be as detailed in BS 8204-6 and strictly in accordance with the manufacturer's recommendations. Care should be taken to ensure that the aggregate is uniformly distributed across the whole area, and that the resin terrazzo system is applied as evenly as possible to reduce the level of grinding required. As resin terrazzo systems are laid insitu, often with the use of natural aggregates, aesthetic variations may occur and are a normal feature of terrazzo flooring.

4.1 Grinding

Grinding to reveal the maximum surface of aggregate should generally commence as soon as the resin has cured sufficiently to permit this without disrupting aggregate. Grinding is normally carried out by machine but small areas may be ground using hand held tools.

Larger sized aggregates will require significantly more grinding to fully expose the surface. Similarly harder aggregates such as calcined flint will require significantly more grinding than the softer marble aggregates and also lead to more rapid wear of the grinding tools.

Grinding can be carried out either dry or wet. If performed in the dry, care must be taken to avoid localised heat build-up and the consequent plucking of the aggregate. Grinding machines with coupled vacuum extraction should be used to prevent a dust hazard. When wet grinding is used, care should be taken to ensure the grinding slurry does not enter the drains, but is collected separately and disposed of in accordance with relevant waste regulations.

Grinding should continue until the aggregate is uniformly exposed and the surface is completely smooth. The floor should then be washed and rinsed thoroughly.

When dry the floor should be thoroughly inspected and any voids opened by grinding should be cleaned out and the surface grouted with a resin paste, pigmented to match the background colour of the resin flooring. It is essential that the paste is worked well into the floor surface to ensure adhesion and to fill all voids.

After grouting, the floor should be kept protected until it is ready for further machining or polishing. This should be carried out using a finer grade of stone to produce a hard, smooth and non-dusting surface.

The use of hand-held grinding machines should be restricted to small areas where it is not practical to use an upright grinding machine, e.g. in toilets, on staircases or on skirtings.

4.2 Seals and Finishing Polishes

After grinding and polishing, the floor may be finished or protected with resin seals or polishes in order to improve the cleanability or hygienic characteristics of the floor. They should be applied strictly in accordance with the manufacturer's recommendations.

Care should be taken in selecting surface treatments to ensure that the slip resistance of the floor is maintained at the agreed specified value.

Similarly surface seals and polishes for antistatic systems must be carefully selected to ensure that they do not have an adverse effect on the properties of the floor.

5. CLEANING & MAINTENANCE

As for all resin flooring, regular cleaning to remove all dust or other contamination is essential. This should be carried out in accordance with flooring manufacturer's recommendations. Any surface damage should be repaired as soon as possible.

It should be noted that it is very difficult to provide 'invisible' repairs to a terrazzo floor firstly because of the orientation of the aggregate around the periphery of the repair; and secondly because of the difficulties of colour matching.

Tyre marks tend to be stubborn and may require the use of specialist cleaning preparations.

Regular use of scrub and rinse cleaning machines fitted with abrasive pads other than the finest grades, or the use of machines with hard plastic bristles, could result in damage to the surface of terrazzo. Damage could also be caused by frequent use of unsuitable cleaning agents, including highly acidic or alkaline detergents and chemicals. Acidic cleaning compositions are particularly harmful if marble aggregates have been used in the terrazzo. For further information on cleaning and maintenance, please refer to FeRFA Guide to Cleaning Resin Floors.

6. GLOSSARY OF TERMS

Levelling screed	screed finished to obtain a defined level and to receive final flooring
Screed	layer of material laid in situ, directly onto a base, to obtain one or more of the following purposes: <ul style="list-style-type: none">- to obtain a defined level- to carry the final flooring- to provide a wearing surface
Synthetic resin	reactive organic polymeric binder for a flooring system comprising one or more components which react in situ at ambient temperatures
Surface regularity	deviation in height of the surface of a flooring layer over short distances in a local area
Flooring	uppermost fixed layer of a floor that is designed to provide a wearing surface
Joint	formed discontinuity in either the whole or part of the thickness of a screed or slab
Self-levelling	capacity of a freshly applied screed material to spread out unaided to form a flat horizontal surface.
Self-smoothing	capacity of freshly applied screed material to form naturally a smooth surface
Resin terrazzo	a mixture of aggregates bound with pigmented synthetic resin
Grinding	the rotation at speed of diamond or resin bonded discs/shoes to effect the grinding process
Polishing	the term used where metal bonded and resin bonded diamond discs are fitted to grinding equipment to produce an aesthetic finish.

7. FERFA PUBLICATIONS

Further information may be found in the FeRFA publications (listed below), all of which are freely downloadable from FeRFA's web site at www.ferfa.org.uk

FeRFA Guide to the selection of synthetic resin floors

FeRFA Guide to the specification & application of synthetic resin floors

Static controlled flooring

Chemical resistance of resin flooring

Osmosis in resin flooring

Assessing the slip resistance of resin floors

FeRFA Guide to installing resin flooring systems onto substrates with a high moisture content

Cleaning resin floors

Guide to PPE for use with in situ resin floors and floor

Guide to seamless resin terrazzo

Flowable polymer screeds as underlayments for resin floor finishes



The Resin Flooring Association

FeRFA

FeRFA, the Resin Flooring Association, represents the major product manufacturers, specialist contractors and surface preparation companies, raw material suppliers and specialist service providers within the UK Resin Flooring Industry. Established in 1969, FeRFA now represents over 90 UK based companies. The Association has established Codes of Practice for full members. It takes an active role in promoting resin flooring and in developing both national and international standards.

All FeRFA publications are freely downloadable from the website at www.ferfa.org.uk for further information, contact FeRFA at: 16 Edward Road, Farnham, Surrey, GU9 8NP
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