

5. Concrete Floor and Cement Screed Surface Preparation Methods

When concrete floor surface preparation is required in addition to any surface cleaning, then there now are a number of cost effective modern techniques and types of equipment available to buy or to hire for your own use, plus there are also a number of specialist Floor Preparation Companies and / or Resin Flooring and Floor Painting Contractors who can also carry out this service for you – Including the floor painting works as well, if you would prefer it.

Buy Floor Paint have developed a network of these specialists throughout the UK, who have demonstrated this expertise and have the experience to do this work quickly and efficiently – For details of these professional floor preparation, or floor painting contractors that also have this capability, please contact any of our offices and one of our flooring specialists will be pleased to assist you.

Below we have tried to present a summary and introduction to the most commonly used and widely available floor preparation and cleaning methods and equipment in the UK today which include:

5. i. Acid Etching We include and reference acid etching in this guide as it still persists in some areas of the country. However - Please do not use '**acid etching**' as it is now only proposed by a few people who have yet to update themselves with the latest technologies and advice in regards to the preparation of reinforced concrete floors and cement screeds to receive floor paints, or indeed they have not read the UK Health and Safety Legislation which strongly advises against any form of acid etching on concrete floors, making very stringent limitations and liabilities clear!

All of the UK Paint Manufacturing and Flooring Trade Associations such as FeRFA and the PMA now All clearly state that the '**acid etching of concrete floors is not recommended**'.

This is basically for a combination of health, environment and floor durability reasons, because the concentrated and diluted acids used (**normally Hydrochloric/Muriatic or Phosphoric Acids**) are **all extremely dangerous in transport, handling and application in the home or on site**, particularly with the large quantities required to etch a concrete floor. The hazards arise from the risks of potential direct acid contact with the skin and eyes, plus the risk of breathing unknown fumes when it reacts and attacks the concrete surface and any contaminants in or on the surface. These chemical gases will therefore depend on the precise type of 'dirt or contamination' on the floor and how it reacts with the acid – **Would you like to risk and breathe these?**

Additionally, it is almost impossible to adequately reclaim, neutralise and safely dispose of the large volume of liquid residue in accordance with Environmental Control Regulations – It is now strictly illegal to allow any of this waste water to enter the drainage- system (**the individuals, the contractor and the facilities management and owner can ALL be charged, heavily fined and made to pay for any and whatever clean-up is required by the Environment Agency and the Local Authority concerned**).

Finally with respect to the concrete floor's durability, the acid will of course also immediately penetrate directly into any cracks or joints in the concrete floor and therefore it will attack the reinforcing bars, steel stanchions or machine base fixings, causing accelerated steel corrosion – The acid will also attack any steel plant or equipment on the floor. Plus to be effective on a floor acid etching requires the concrete to be absolutely saturated with water before the acid's it's application, then following the reaction time (very varied), this is followed by multiple rinsing of the surface with clean water to remove the acid and other

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residues which then significantly extends the floor drying and waiting times. Some of the calcareous and other soluble salts produced in the acid's reaction with the concrete surface are also inevitably left in the concrete; these **acid residues can also subsequently cause osmotic blistering or de-bonding and delamination of floor paints**. These subsequent problems can arise even several weeks or many months later and after what may have initially seemed to be a successful job was 'completed'.

SO PLEASE DO NOT ACID ETCH YOUR FLOORS – it is never worth the risks

– If surface preparation is necessary then it makes sense to use mechanical grinding or vacuum blastcleaning, especially with the extremely efficient and cost effective equipment now available for hire – or you can get a local specialist to do it – We can recommend many competent floor preparation specialist contractors that can prepare your floor, or they will even contract to do the whole job and apply the concrete floor paint on your project – This network of contractors are available for floor painting projects anywhere in the UK.

5. ii. Mechanical Surface Preparation of Concrete Floors: The development in mechanical floor preparation equipment has been considerable over the last 10-20 years, with modern purpose made vacuum blastcleaning, grinding and rotary scabbling machines now widely available. The new machines are fast, precise, controlled and almost totally dust free. Therefore they are also very cost effective on site.



A Typical Small Floor Grinding Machine



A Typical Medium-Size Vacuum Blasting Machine

Buy Floor Paint can provide you with details on the most appropriate method and equipment to use for your project, together with the names of hire companies that will rent you these machines or, if you prefer, specialist floor preparation contractors that are very experienced in their use, so they can usually do the work for you and even more competitively than you can yourself! Indeed most of the UK's major resin - flooring and floor painting specialist contractors also now use these companies to do their floor surface preparation work. Therefore it is very often cost effective to get one of our specialist flooring contractors to do the whole job for you and provide a guaranteed floor finish – especially on larger areas over a few hundred square metres.

For more details on floor preparation equipment, floor preparation contractors or resin floor painting contractors near you, please contact any of our offices and our flooring specialists will

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be pleased to assist you on your specific project.

The following is a brief overview of the different mechanical floor preparation techniques and equipment available for concrete floor surfaces:

5. ii. A. Hand Wire Brushing to prepare Concrete Floors for Painting

Whilst this is not really 'mechanical equipment' and obviously impractical for large industrial or commercial areas, hand wire brushing can be useful, practical and cheap for smaller areas, such as domestic garages or workshops, etc.

The wire brushes should be used wearing good tough gardening / construction gloves (to prevent taking your knuckles off!) and disposable masks (to avoid choking yourself on the dust created!) Work evenly over the surface, removing any soft and friable material – Hand wire brushing will not be suitable for dense, power floated concrete floors as they will not be strong enough and may even only polish the surface. – Stronger mechanical preparation equipment will be required for these surfaces – see below. When the surface has all been uniformly brushed and all of the soft / friable material has been removed, sweep thoroughly and vacuum to remove the residual dust from the surface pores of the concrete.

5. ii. B. Mechanical Grinding to Prepare Concrete Floors for Painting

Mechanical floor grinding machines were the most widely used type of floor preparation equipment, but they lost market this position with the improved development of vacuum blastcleaning machines. The main reasons for this being that the modern vacuum blastcleaning machines have become much more affordable and they are much faster, with greater uniformity of finish. Plus there is also the technical argument that grinding can force dust into the surface pores and therefore this can create an 'integral debonding agent' or even 'polish' the concrete surface thus greatly reducing subsequent adhesion of the floor paint.

However in recent years floor grinding machine manufacturers have also progressed and developed efficient vacuum floor grinding machines with different sized grinding 'heads'. Certainly on small to medium sized projects, up to a few hundred square metres, these new grinding machines can also provide an efficient and cost effective solution. Generally wire brush 'heads' should be avoided for this purpose as they will actually polish already dense floor surfaces. The abrasive diamond grinding heads are more appropriate for use prior to floor painting.

Good mechanical grinding machinery manufacturers include HTC (Swedish), Asuga (Danish) and Klindex-Chemspec (Italian). We do not currently know any that are still made in the UK, but these machines are widely available.



Typical Modern Floor Grinding Machines and their Vacuum Dust Extraction Attachment

Important Note: These modern grinding machines are in fact clearly the best equipment to use if:
-the floors to be prepared are wet or damp at the time, because vacuum blastcleaning machines do not work at all well on damp / wet concrete surfaces.

if the floor surfaces are uneven and profiled, then the machines grinding action also increases uniformity and reduces any excessive profiles that would adversely reflect through a floor paint coating,
if there are 'rubbery' residues on the floor to be removed, such as old elastomeric coatings, bituminous materials or flexible / elastic adhesive residues - like, those used for some floor tiles or sheet vinyl floors, because vacuum blastcleaning does not remove these materials very well. This is because the impact of the shot is deflected or absorbed by these 'rubbery' materials.

Today these modern mechanical floor grinding machines are widely available to hire, or there are specialist floor preparation contractors who can do this work efficiently and effectively for you. As a guide, dependent of the area to prepare, the specific model of machine and grinding heads, the floor condition, access, etc., then up to 1000m² per day can be readily achieved.

If you would like more specific advice on the right mechanical floor grinding equipment for your specific project, then please call any of our offices and one of our flooring specialists will be happy to assist and advise you.

5. ii. C. Vacuum Blastcleaning of Concrete Floors for Floor Painting

The principle of blastcleaning is firing sand, grit or steel shot abrasive at high velocity in a stream of air, at an angle to the concrete surface. The localised impact removes any loose or friable materials and it also locally fractures and very effectively removes any brittle layers, such as cement laitance.

This used to be a very noisy, dirty, dusty and disruptive process, but the development of modern high performance and very efficient machines with integral vacuum collection of the dust and waste, plus the use of recoverable rounded steel shot, means that the process is now very fast, clean, and controllable, plus it is almost dust free.

Due to the partially magnetic recycling process, the abrasive used in these modern machines is always now steel shot.

Small machines are available for hire with a 200-250mm wide enclosed head that can prepare

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approximately 50m²/hour – these cost around £300 per day or £800 per week, (always get a magnetic roller for around £15/day as well, to recover and recycle more of the shot and therefore save costs on bags of shot that are around £30/25kgs).



A Typical Small Vacuum Blastcleaning Machine and Dust Extraction Attachment for Concrete Floor Preparation

Medium sized vacuum blastcleaning machines capable of preparing around or even over 100m²/hour are available from around £400/day; however these will usually require an industrial 3 phase electrical supply. Large machines, including ride on equipment are also available for very large areas, but these are not available for hire and are only suitable for professional use.



Typical Medium Sized Vacuum Blastcleaning Machines

Buy Floor Paint can advise you on the most appropriate vacuum blastcleaning machines and equipment for your project, plus where you can hire them to do the work yourself. Alternatively we can also put you in touch with professional floor preparation contractors that, are very experienced and can therefore carry out your floor preparation works efficiently and cost effectively for you.