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# A-Z OF TILING

Every week as part of our “Stay Positive, Back Stronger” campaign we will be providing you with our A-Z of Tiling Terms. Get in-depth description of many of the common tiling terms, plus some expert insight or top tips from our team.

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## PENDULUM TEST

The pendulum coefficient of friction test was developed with the intention of providing a ‘portable’ method of assessing slip resistance on flooring, where slips account for at least 35,000 accidents annually in the UK. The standardised test, as defined in BS 7976: Parts 1-3, 2002 , is used to measure the dynamic coefficient of friction in order to measure the slip potential of tiles and other flooring. A swinging arm with a standardised rubber sole, is swept over a set flooring area in a controlled way. The slipperiness of the flooring is shown as a pendulum test value, also known as a slip resistance value.

## BAL INSIGHT

Always consider slip of tiles before installing, The Tile Association can provide this service and test the slip resistance and guidance. The Pendulum test is the preferred method of testing by the Health and Safety Executive (HSE).

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# PERIMETER MOVEMENT JOINTS

Required where tiles meet restraining elements, including walls, window and door frames, baths and other fixed building elements. They provide the flexible connection necessary to accommodate any movement of the tiled surface caused by environmental and other changes. These can include temperature or humidity changes or increased loading.

## BAL INSIGHT

Every tiling installation will require a perimeter movement joint. Formed using matching silicone to the grout colour or installing using preform movement joints depending on the spec and preference. Always leave a minimum of 6mm gap and never fill will a flexible grout.

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# PITTING

Small indentations in the finished surface of an individual tile, typically the result of corrosion, cavitation or manufacturing defects. Such indentations at the corners or edges of a tile are more likely to have been caused by the sharp edge of a trowel.

## BAL INSIGHT

Always check all defects before starting or if it can be used for cuts. Make sure all boxes of tiles are mixed up to help with design and shading.

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## PLASTER

A powdered mixture of either cement, lime or gypsum and water, which may or may not be combined with aggregate, which forms a paste when mixed with the right amount of water. When this is applied to a surface, it adheres and subsequently hardens to a rigid representation of the form or texture imposed upon it while still plastic. Used to refer to both the paste and the hardened mixture.

## BAL INSIGHT

Always leave to dry for a minimum of 4 weeks and never tile onto Bonding or Browning plaster. If the finishing plaster is polished, remove with a stiff bristled brush and prime the surface (dilution depending on the adhesive used). Note: weight of tiles is important, Plaster as a weight limit of 20kg per m², equivalent to a minimum 8mm thick ceramic tile or a maximum 7mm thick natural stone tile (including the weight of the tile adhesive).

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# PLASTERBOARD

A globally used building material, also known as gypsum board or drywall, used for the finish construction of interior walls and ceilings. Paper is used to cover an inner core of plaster mixed with fibre, typically fibreglass or paper, plasticiser and water. Various other components are added, including additives designed to retard the growth of mildew and to increase fire resistance.

## BAL INSIGHT

Ideal to be tiled onto direct (decorating side of the board), providing a flat surface for tiling. Weight limit is increased to 32kg per m².

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## PACKING HOUSE TILE

An unglazed tile made from natural clay, similar to a quarry tile but typically of greater thickness.

## BAL INSIGHT

Ideal to be used externally and generally cut using a wet cutter because of the thickness. Also, if using a pigmented colour grout a protective sealer would be advised.

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## PAVER

An unglazed natural clay or porcelain tile for exterior use in such areas as drives and patios. Formed by dry pressing, pavers are thicker than standard flooring tiles.

## BAL INSIGHT

When laying any materials, consider checking if a DPM is installed or if one need to be required. Drainage mats or pedestals (not for drives) can be used depending on the use and thickness of the paver/porcelain.

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## PLASTICISER

A material that increases fluidity or plasticity of a mortar, cement paste, or concrete mixture. When added to plaster, less water is required, and drying times are reduced.

## BAL INSIGHT

Used in mortars and not recommended in cement-based tile adhesives.

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# PORCELAIN

A vitreous ceramic whiteware which can be glazed or unglazed, created by heating raw materials, typically including clay in the form of kaolin, to high temperatures. Porcelain's properties can include brittleness, durability, glassiness, hardness, resistance to chemical attack, resistance to thermal shock, resonance, strength, translucence, whiteness, low elasticity and low permeability. Its durability, strength and translucence derive from the formation of glass and mullite within the material during firing. Porcelain tiles are dense, normally impervious, fine-grained, smooth and usually produced in clear colours. By definition, porcelain tiles are dense and have a water absorption of ≤0.5% (see BS EN 14411).

## BAL INSIGHT

Always consider all tiling tools used including drilling. To improve adhesion to the tiles always use a flexible polymer modified adhesive. Certain polished porcelain may require the use of protective sealer when grouting using darker colour grouts.

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## POROSITY

The relationship of the open pore space, meaning the spaces between individual particles within material, to the bulk volume. It is expressed as a percentage so, the higher the figure, the greater the amount of open pore space. In ceramic tiles, the degree of porosity can influence mechanical strength, durability and frost resistance .

## BAL INSIGHT

This can impact on where the materials can be used i.e. walls/floors internal/external etc. when sealers are required and even how soon grouting can start washing off.

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## POT LIFE

The period of time during which a material, such as adhesive or grout, maintains its workable properties after it has been mixed.

## BAL INSIGHT

Never extend the pot life of any product by adding more water once the pot life is over.

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# PREPARATION-ADMIXTURES

The use of polymer admixtures with cementitious adhesives can improve their physical properties and performance, including adhesion and flexural strength. Similar admixtures are also available for use with grouts. Both types normally require dilution with clean water in varying proportions, in accordance with the manufacturer's instructions, and are available for both interior and exterior use.

## BAL INSIGHT

Admixtures are not always used in all adhesives and grouts, always follow the instructions and never add more because this may cause problems with both application and performance.

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# PREPARATION - FLOOR LEVELLING

Self-smoothing compounds are available, as single-part or two-part products, for levelling uneven floor backgrounds. They are available for use with exterior and indoor installations and for wet and dry areas.

## BAL INSIGHT

Not all levellers can be used for external so always check beforehand. In a lot of cases if using fibre levellers, spike rollers are not normally used. Certain leveller may require longer drying time when applied in thicker coats. Also, when other materials are used such as vinyl's etc, drying times are exceeded.

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# PREPARATION - WATERPROOFING

Waterproof coatings and tanking systems are recommended for pre-preparation prior to tile fixing, particularly when applied in such wet duty installations as wet rooms, showers and, if required bathrooms and, sometimes, kitchens and laundry rooms. They should also be used around pipework, drainage channels and in other potentially wet zones. They can be used with most backgrounds and require, typically, 24 hours to set or using rapid-setting systems.

## BAL INSIGHT

Depending on the background material (plaster/plasterboard and certain cement/tile backer boards), in most cases it is important to protect the surface from water and tiles with a waterproof grout is not a substitute for tanking.

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# PREPARATION - FLOORS

All floors require some form of pre-tiling preparation, varying according to the surface being tiled. The aim is to provide a tiling background which is clean, dimensionally stable, rigid and flat enough for the tiles to adhere properly for a durable finish. The need for dimensional stability of some surfaces, such as sand-and-cement screeds and concrete, may be beyond the fixer's control. Fixers can influence the rigidity, flatness and cleanliness of the surface.

The first step is to determine whether the surface is capable of being tiled. Any background containing linseed oil, such as linoleum, will be unsuitable. Other unsuitable backgrounds will include resilient floorings including cork and rubber, parquet floors and any other flooring which is likely to be insufficiently rigid or susceptible to deterioration once covered with an impervious flooring. Fixers working on older (pre-1920) buildings should look out for magnesite, coloured pink or greenish-blue, which needs to be completely removed and replaced with an alternative screed.

Before tiling can begin on any surface, a floor must be clean: free of dirt, dust, grease, plaster, paint and any other material that could form a barrier to the adhesive. It also needs to be level and true.

A new sand-and-cement screed should have had at least three weeks to dry. For new or existing screeds any hollow or weak areas must be cut out and repaired. This assumes ideal conditions, of 20° C and 65% relative humidity. If conditions are less suitable, with a cooler or poorly ventilated environment, the drying time will need to be extended. When the fixer is laying the screed as well as the tiles, they should cover it with an impervious sheet for the first seven days, then allow it to air-dry for at least a further two weeks.

Particularly dry or dusty surfaces should be primed. Note that anhydrite screeds based on gypsum-derived calcium sulphate or anhydrite (anhydrous calcium sulphate) can look like traditional sand-and-cement screeds but require specialist treatment. If in doubt, check. Such screeds need the surface to be primed using a suitable proprietary product or covered with a watertight polyethylene membrane, to protect against penetration by moisture, to which gypsum is especially sensitive.

A new concrete floor will need to have been laid for at least six weeks before tiling can start, in order that shrinkage can have taken place. As with sand-and-cement screeds, this should be extended if the drying conditions are poor. First, it has to be examined for any weak or hollow areas which need cutting out and repairing. If necessary, a primer should be used.

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# PREPARATION - FLOORS (CONT..)

Both sand-and-cement screeds and concrete are likely to have laitance when newly laid, which will have to be mechanically removed to enable correct adhesion of the tiles. Older surfaces may retain residues of previously used adhesives, which may have to be removed.

When tiling heated screeds, these should be pre-heated (conditioned) before fixing. There will also be a need for movement joints within the screed, with a further requirement for metal mesh reinforcement of the screed.

When fixing onto existing ceramic or natural stone tiles, these should be checked first. They need to be sound, clean and firmly bonded to their beds. If the tiles are terracotta or quarry tiles, they may have been polished with waxes and will require more intensive cleaning to remove these. Any existing movement joints should be noted and carried through to the new tiling.

Wooden tongue-and-groove floorboards need to be dry and free of paint, wax, varnish or other finishes. They should be fixed securely to joists, using non-rusting screws with the fixings not protruding. If the floor is free from deflection, tiling can be carried out using appropriate primers and adhesive. Otherwise, the use of a water-resistant plywood or tile backing boards may be necessary. In the worst cases, it may be necessary to re-lay the floor, with the boards lifted and additional noggins inserted between the joists.

Timber-based boards can be treated in the same way as tongue-and-groove floorboards. If WBP (water and boil proof) plywood has been used as an overlay, it should be allowed at least 48 hours to acclimatise before further work. The plywood's surroundings, backs and edges should be sealed with a suitable proprietary sealer to prevent distortion due to atmospheric moisture and it should be screwed down at 300mm intervals with non-rusting screws. Note that any plywood other than WBP quality will be unsuitable as a background for tiling, as will MDF, hardboard and chipboard. Such surfaces need to be removed or overlaid with tile backing boards before tiling.

If there are existing vinyl tiles or sheet, these need to be firmly bonded to the background and thoroughly cleaned of any loose or brittle material, waxes, polish or other contaminants. Linoleum, cushioned vinyl, thermoplastic tiles and the associated adhesive should be removed. A smoothing compound should be used for repairs, as necessary.

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# PREPARATION - FLOORS (CONT..)

## BAL INSIGHT

By preparing the floor it will help in many ways, better adhesion, speed of installation, provide a solid framework for tiling and a flat surface. All this will reduce costs in the long term and provide a quality installation.

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# PREPARATION - WALLS

As with floors, walls will always require form of pre-tiling preparation to create a background that is clean, dry, flat and free from any barriers to adhesion.

For plaster and plasterboard, the surface should be checked for loose or hollow-sounding areas and repaired as necessary. Any traces of previous wallpaper or wallpaper adhesive should be removed. If any re-plastering is necessary, or the surface is newly plastered, it should be left to dry and shrink for at least four weeks. This period will need to be extended if the environment is cold or damp. Once dried, any fine plaster particles should be removed using a stiff-bristled brush. Before fixing, prime the wall with an acrylic primer, either diluted or undiluted according to the manufacturer's instructions. As plaster is not water-resistant, a waterproof coating/tanking system should be applied for installations in shower rooms and similar wet areas.

Sand-and-cement render is mainly found in commercial and industrial premises. If it is at least two weeks old, it requires little preparation beyond cleaning and checking for soundness, dustiness and flatness for tiling.

Apart from sand-and-cement render, tile backing boards represent the best surface for fixing wall tiles. Provided that they are securely fixed, clean, dry and straight, no additional preparation is generally necessary.

If tiling is to be fixed to a painted surface, the most vital aspect of preparation is either to remove the paint completely before starting, to reveal the surface underneath, or to cover it with a tile backer board. Certain paints, such as emulsion, will generally not be sufficiently adhered enough to support the weight of tiles.

Existing ceramic or natural stone tiles can be tiled over, provided that the correct adhesive is used and that the total weight of both old and new tiles can be supported by the underlying surface. They will need to be cleaned with a suitable detergent, dry and free of dust. Any cracks, holes or other blemishes will have to be repaired with an appropriate filler, which will need to be allowed to dry completely in accordance with the manufacturer's instructions. The existing tiles should then be scored with a tile scriber, in both horizontal and vertical lines, to improve the bond with the new tiles. It is usually worth considering the complete removal of existing tiling, as the increased thickness may mean that the new tiles do not align correctly with door frames, windows and other edges.

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# PREPARATION - WALLS (CONT..)

## BAL INSIGHT

Just like floor preparation it is important to provide a dry, solid, clean flat surface and making sure the tiles can withstand the weight for the tiling. Never short cut the prep in any case, this can lead to installation problems further down the line.

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## PRIMER

A liquid, typically acrylic-based, used for preparing floor and wall backgrounds prior to fixing of ceramic/mosaic and natural stone tiles. It may need to be used either undiluted or diluted in varying proportions according to the background, tile type and environment. It needs to be used in accordance with the manufacturer's instructions. Fixing can normally begin approximately 30 minutes after priming (depending upon temperature and humidity). Note that PVA-based primers are not normally recommended for tiling applications, as the water content changes the constituency of the PVA, returning it to a tacky state. It prevents the adhesive from penetrating the substrate which could lead to de-bonding of tiling.

## BAL INSIGHT

We sometime unsure when priming is required. Priming provides a mechanical key to help with adhesion, protects against chemical reactions (plaster and cement), and allows to keep the water in the adhesive mix to help to setting (such as porous materials like new screeds and boards). Always apply an even coat and follow the dilution amounts recommended.

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## POLISHED SURFACE

The face of a natural stone or porcelain stoneware tile which has been ground with fine abrasives to produce a shiny finish.

## BAL INSIGHT

This is a technique used with terrazzo to provide a smooth flat surface after fixing.

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# POLYMER MODIFIED

Polymers were first used as additives to cement mortars and concrete during the 1920s, when natural rubber latex was added to road paving materials. There has been considerable subsequent development of commercial products, called admixtures, with a significant area of polymer-modified Portland cement being the production of tiling adhesives and grouts. Polymer-modified adhesives are often referred to as thin-set mortars. The polymers interact with the cement's components when in contact with water and several different types have been used to improve application and the physical and mechanical performance characteristics.

Polymer modification of adhesives and grouts offers improvements including easier handling, increased tensile and flexural strength, enhanced adhesive characteristics, improved water resistance and greater durability. It also tends to prolong the hydration period, giving increased density and shear strength, extending the working time and, of particular importance with grouts, promoting colour uniformity in the end product. A key benefit is increased water resistance. Adding latex to a typical grout will reduce water absorption to around 3% to 5%, compared with a range of 10% to 20% for the standard product. The advantages are easier maintenance, increased durability and greater resistance to the potential damage from freezing and thawing cycles.

## BAL INSIGHT

Dry power polymer modified cementitious based products allows for consistency of mixing. When using liquid admixtures always use at the correct dilution rate. It is best to pre-dilute with water before starting (use the bottle of liquid to provide the correct volume of water). When used in grouts be aware it can change the colour of the finished grout. Very important to achieve consistency mix to mix water to liquid to powder ratios in all cases.