Section two

PREPARATION OF SUBFLOORS

The quality of a finished installation can be very much dependent upon the preparation of the subfloor and the attention paid to the recommendations made in various local codes of practice and by the manufacturers of the component parts.

The information in this section is provided as guidance based on many years of experience in this field. Ensure reference is always made to local and national standards of the country where the product is to be installed.

It is important to avoid problems at the outset and as such if you are unsure of any of the information listed below, we recommend that you contact the Polyflor Customer Technical Services Department (CTSD) either directly in the UK, through your local distributor for other countries or through our website polyflor.com. Alternatively, discuss your requirements with your preferred supplier of smoothing compounds and adhesives.

2.1 NEW CONCRETE AND SCREED BASES

The most common cause of failure in these types of substrate is moisture, either as construction moisture or the lack of an effective moisture barrier on direct to earth subfloors. Failure to adequately control the moisture can subsequently result in debonding of smoothing compounds, adhesives and may promote adhesive related staining of the floor covering.

2.2 CONSTRUCTION MOISTURE

Prior to laying any Polyflor vinyl and rubber flooring, it is essential to ensure that all free water, which can affect adhesion, is allowed to evaporate from the base. The rate of drying is influenced by many factors including design of the base, ambient temperature and humidity, concrete quality, amount of construction water used, surface finish attained, use of special concrete additives and especially the thickness of the base. Exact drying out times cannot be provided due to these variabilities, however, as a guide, allow one month per 25mm for the first 50mm and an increasing time for each millimetre above this thickness.

For example, a base 150mm thick in monolithic construction, drying from one face only, can take up to twelve months to dry sufficiently in order to take a floor covering. At the planning stage if it is obvious that there will be insufficient drying time, then the situation should be discussed with Polyflor, who can offer proven alternatives to suppress the construction moisture.

2.3 MOISTURE TESTING

Unless specifically stated within the individual product range literature Polyflor flooring should only be laid on subfloors which do not suffer from rising damp or hydrostatic pressure, and where the moisture level does not exceed 75% RH.

KEY POINT
Solid substrates should NEVER exceed 75% RH

The Hygrometer is the only method of test acceptable to Polyflor, and only readings taken over at least a 72 hour period should be considered to represent the moisture content of the subfloor.

Subfloors with a relative humidity in excess of 75% will invariably cause failure of the bond between the substrate and the floor covering, and in

some cases, discolour the flooring. To remedy such situations, the whole floor covering will have to be removed, the subfloor treated to resolve the moisture problem and a new floor covering laid. In an occupied building, this can cause severe disruption to the work routine.

To prevent these situations arising, Polyflor does not condone the practice of laying vinyl and rubber floor coverings on subfloors with moisture content readings above 75% RH and accepts no responsibility for non-performance of Polyflor products in such instances.

In countries outside of the UK, alternative moisture measurement methods are also used. Advice on 'Local' regulations should be sought.

2.4 EXISTING CONCRETE AND SCREED BASES

Existing concrete and sand/cement screed bases as described in BS 8204, if laid directly to ground, must contain an effective DPM. If one is not present or is suspect, a suitable surface DPM should be applied.

KEY POINT
When installing Polyflor resilient flooring it is ESSENTIAL to apply a cementitious smoothing compound of at least 3mm thickness.

- In **all** instances, a cementitious smoothing compound of **at least 3mm thickness** must be applied wherever the Polyflor resilient flooring is to be installed; this must be done prior to the installation of the floor covering. The smoothing underlayment supplier will advise on the correct product to use from their range that suits both the end use application and subfloor construction. If applicable, they will also advise on the correct primer to apply.

2.5 POWER FLOATED CONCRETE

Power floated concrete bases as described in BS 8204, if laid directly to ground, must contain an effective DPM. If one is not present or is suspect, a suitable surface DPM should be applied.

- Smooth dense concrete subfloors – such as those created by a power floated finish – can prove difficult to bond to, due to the impervious nature of the surface. In such instances, the floor should initially be shot blasted to remove the top surface and then made good.
- In **all** instances, a cementitious smoothing compound of **at least 3mm thickness** must be applied wherever the Polyflor resilient flooring is to be installed; this must be done prior to the installation of the floor covering. The smoothing underlayment supplier will advise on the correct product to use from their range that suits both the end use application and subfloor construction. If applicable, they will also advise on the correct primer to apply.
- Surface hardeners or curing agents should not be used with power floated concrete, as these can also impair the adhesion of the floor covering.

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2.6 MASTIC ASPHALT UNDERLAY

Mastic asphalt underlays as described in BS 8204: Part 5 should conform to BS 6925. Comprising asphaltic cement and suitable aggregates, the asphalt is applied in its hot state onto a glass fibre quilt.

KEY POINT
Never apply Polyflor floor coverings directly onto a mastic asphalt subfloor.

- Normally a thickness of 15mm to 20mm is applied and the asphalt brought to a finish with a wooden float. The resulting underlay is impervious to moisture and, if continuous with the DPC in the walls, makes an excellent subfloor for Polyflor vinyl and rubber flooring, providing a 3mm thick smoothing underlayment is first applied.
- The asphalt must not just be skim coated it is important to ensure that the smoothing underlayment is of a type recommended for use on asphalt floors and that a suitable primer key coat is applied if directed.

2.7 MAGNESITE FLOORS

Composition floors which are composed of magnesium oxychloride cement or polyvinyl acetate/cement are highly absorbent. As such, if overlaid with an impervious material, they can break down due to the effects of rising moisture, as the majority of these floors do not incorporate an effective DPM.

- In all instances where the material is laid directly to ground, Polyflor recommend that the screed be uplifted and relaid incorporating an effective DPM.
- For floors that are on the first floor or above, cracks and small hollows should be patch filled and a cementitious smoothing compound of **at least 3mm thickness** must then be applied, prior to the installation of the vinyl floor covering. The smoothing underlayment supplier will advise on the correct product to use from their range that suits both the end use application and subfloor construction. If applicable, they will also advise on the correct primer to apply.

2.8 TERRAZZO

Terrazzo has a dense hard surface, which is normally impervious. The floor must be sound and firmly fixed and any loose or powdery material removed from the joints.

- The surface should be thoroughly washed/degreased to remove any surface contaminants and any cracks cleaned out and filled with a suitable resin bonded cement/sand mixture. The surface may also need some mechanical abrasion to enable the smoothing underlayment to key to the surface.
- **In most instances**, a cementitious smoothing compound of **at least 3mm thickness** must then be applied prior to the installation of the vinyl floor covering. The smoothing underlayment supplier will advise

on the correct product to use from their range that suits both the end use application and subfloor construction. If applicable, they will also advise on the correct primer to apply.

2.9 QUARRY TILES/CERAMIC TILES

Heavily glazed surfaces are quite common with these types of flooring and tiles must be sound and firmly fixed with all loose and powdery grout removed from the joints.

- Generally the tiles will require mechanical abrasion of the surface in order to provide a key for the application of a smoothing underlayment.
- The surface should be thoroughly washed/degreased to remove any surface contaminants and then a cementitious smoothing compound of at least 3mm thickness must then be applied prior to the installation of the vinyl floor covering. The smoothing underlayment supplier will advise on the correct product to use from their range that suits both the end use application and subfloor construction. If applicable, they will also advise on the correct primer to apply.

2.10 SYNTHETIC ANHYDRITE/CALCIUM SULPHATE/GYPSUM SCREEDS

These types of screed can be difficult to identify – if in any doubt check with one of our approved adhesive manufacturers or the subfloor preparation products manufacturer prior to commencing the installation.

- Always check the screed for moisture prior to installation. Should you suspect the screed to contain excessive moisture seek advice from one of our approved adhesive manufacturers or the subfloor preparation products manufacturer prior to commencing the installation.
- These types of screed can also be affected by laitance and moisture in the smoothing compound, resulting in the loss of bond. Any such laitance should be mechanically abraded and fully removed.
- Anhydrite/Calcium Sulphate/Gypsum screeds also require the application of a special primer before the installation begins. In all instances installations on these types of substrate should be discussed beforehand with one of our approved adhesive manufacturers. If a failure occurs, it is normally below the vinyl floor covering and as such Polyflor will not accept responsibility for failure.

2.11 EXPANSION JOINTS

Expansion joints are incorporated into buildings to permit movement without cracking.

- It is important that these joints extend through the floor covering.
- Proprietary expansion joint covers are available which blend with the floor covering and disguise the joint. Some are made of vinyl that incorporates a flexible portion and are welded to the abutting vinyl to form an impervious layer. Other types are a combination of aluminium and PVC, which again contains a flexible section.

Filling the expansion joint with sealant which is not specifically designed for expansion joint filling or floor smoothing underlayment will lead to floor failure and is not recommended by Polyflor.

KEY POINT
Never lay Polyflor resilient flooring over expansion joints.

2.12 TIMBER SUBSTRATES

New timber suspended floors should be constructed of either plywood or chipboard specifically manufactured for flooring. Spacing of the supportive joists should be in accordance with the manufacturer's recommendations in relation to the board's thickness.

2.12.1 Chipboard

Chipboard floors are widely used as load bearing substrates; however Polyflor recommends that this type of substrate should be overlaid with plywood sheets conforming to EN 636-3 with a minimum thickness of 5.5mm, as described in Section 2.12.6.

- For joist centres up to 450mm use 18mm thick load bearing chipboard.
- For joist centres of 610mm use 22mm thick chipboard.
- All chipboard should comply with EN312, be P grade P4, P5, P6 or P7.
- Boards must be conditioned on-site by loose laying them individually or loose stacking them in the temperature and humidity conditions which will prevail in service, for at least 3 days prior to fixing.
- Do not lay boards with a moisture content of less than 7% or greater than 18% (when tested using an electrical resistance moisture meter).

2.12.2 Chipboard floating floors

Polyflor recommends that the chipboard floating floors should be overlaid with flooring grade plywood conforming to EN636-3 with a minimum thickness of 5.5mm, as described in Section 2.12.3 below; with the plywood laid half bonded over the chipboard joints, screw fixed or nailed as described in Section 2.12.6.

2.12.3 Plywood

- Plywood should be External Grade Class 3 conforming to EN 636-3 or EN 13986 with one side sanded.
- The boards should be 1200mm x 2400mm and of minimum thickness 15.5mm.

- The boards should be laid with the longer side at right angles to the joists and the shorter side must have solid bearing on the joists.
- Fixing should be carried out at 300mm centres with annular (ring-shanked) nails or lost head nails of length at least 2.5 times the thickness of the board or divergent staples.
- For joist centres up to 450mm use 15.5mm thick plywood.
- For joist centres of 610mm use 18mm thick plywood.
- Plywood sheets must be conditioned on-site by loose laying them individually or loose stacking them in the temperature and humidity conditions which will prevail in service, for at least 3 days prior to fixing.

KEY POINT
Do not use sheets with a moisture content of less than 7% and greater than 14% (when tested using an electrical resistance moisture meter).

2.12.4 Woodblocks/Granwood Flooring

Although many woodblock floors appear sound, even when overlaid with plywood, the application of an impervious floor covering on a direct to earth subfloor can cause expansion and lifting of the base.

Polyflor recommends that, in all cases, the woodblock floor be removed and the subfloor brought up to the required standard to accept Polyflor resilient flooring.

2.12.5 General

- All nail and screw heads must be below the surface of the board and any indentation filled with a suitable flexible underlayment, as should the joints between any boards that have been used to overlay the existing floor.
- Due to the extensive choice available of these types of smoothing compounds and differing opinions on priming; Polyflor recommends that advice is sought beforehand with a suitable subfloor preparation manufacturer.
- Please note that priming will minimise adhesive usage and maintain the open time of the adhesive and prevent preferential absorption.

2.12.6 Existing wooden floors

Existing wooden floors may have received a preservative treatment that will cause poor bonding, due to a chemical interaction between the preservative and the adhesive. In such cases, they should not be laid onto directly.

- All loose boards should be firmly nailed to the joists and any worn or broken boards replaced. The floor should be sanded to remove high spots and any hollows or cracks filled with a suitable flexible underlayment.

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- The existing wooden floors should then be overlaid with suitable flooring grade plywood of a minimum thickness of 5.5mm which conforms to EN636-3.
- The sheets should be laid with staggered joints.
- The plywood should be fixed to existing floorboards using suitable annular ring shank nails of minimum 20mm length; or suitable countersunk wood screws.
- Fixings should be at 100mm centres along the edge of each sheet, with a fixing line 12mm from the edge and thereafter at 150mm centres throughout the entire area of the sheet.
- Perimeter fixings must not be more than 18mm from the board edges.
- Plywood should be conditioned as described in Section 2.12.3 prior to application of the floor covering.
- With suspended timber at ground level, it is of vital importance to obtain good ventilation below the floor through the existence of air bricks. Without good ventilation, the application of an impervious floor covering could lead to dry rot in the structure beneath. Always seek advice from the smoothing underlayment manufacturer for the correct product for your specific application.

2.13 OTHER SUBSTRATES

2.13.1 Metal bases

Metal bases are generally, but not exclusively, steel and can be contaminated with rust or oxidisation, oil and grease.

- The surface should be thoroughly degreased and then abraded or wire brushed to remove the rust or oxidisation.
- Any high spots may need to be ground off.
- In most instances, but not where there is excessive vertical or lateral flexing or movement, a suitable cementitious smoothing compound of at least 3mm thickness must then be applied prior to the installation of the vinyl floor covering. The smoothing underlayment supplier will advise on the correct product to use from their range that suits both the end use application and subfloor construction. If applicable, they will also advise on the correct primer to apply.

2.13.2 Painted or epoxy coated floors

- Epoxy and polyurethane surface coatings should be removed, in order to ensure that no breakdown of the sub-floor occurs after installation of the resilient floor covering.

- Painted floors will impair the adhesion of the resilient floor covering and should be removed prior to the application of the floor covering. Mechanical methods such as grinding or blasting are the most suitable methods for removing these coatings. However, where the paint proves difficult to remove, the floor may need to be scabbled. If the epoxy coating is well bonded to the subfloor, it is possible to apply the floor covering after grinding or blasting.
- In both instances, the surface should then be made good with a 3mm minimum coating of a suitable cementitious smoothing underlayment applied in accordance with the manufacturer's recommendations, which may include the application of a primer key coat.

2.13.3 Loose lay isolating membranes

Polyflor recommend that subfloors be prepared in accordance with the relevant code of practice BS 8203. Any installations incorporating loose lay isolating membrane systems within the marketplace, which are used to overlay contaminated subfloors, existing floor coverings, etc. are solely underwritten by the individual membrane manufacturer.

2.13.4 Existing floor coverings

Unless specifically stated within the individual product range literature Polyflor resilient flooring should never be laid over existing floor coverings and in such instances where this is carried out, Polyflor accepts no responsibility for non-performance of its products.

- All existing floor coverings must be uplifted and as much as possible of the old adhesive removed from the subfloor.
- Special care must be taken on very old floors, as some products – but not Polyflor – contained asbestos. In these instances, contact Polyflor for further information.
- The removed floor coverings should be reclaimed and recycled, providing that there is no heavy contamination.
  Polyflor is one of two founder members of Recofloor, the industry funded vinyl take-back scheme.
- A suitable floor smoothing underlayment with a minimum thickness of 3mm should then be applied to the whole floor. Failure to remove sufficient adhesive can lead to premature failure of the underlayment.
- After uplifting existing floor coverings laid on plywood, used as fabricated underlay, replacing the plywood is almost always necessary.
- After uplifting existing floor coverings laid on suspended chipboard; hardboard or plywood subfloors, plywood sheet with a minimum thickness of 5.5mm should then be applied to the subfloor as described in Section 2.12.6.

RECOFLOOR

To enquire about recycling end of life vinyl flooring (uplifted and off-cuts), email Recofloor at **info@recofloor.org**

2.13.5 Access Panels

When access is no longer required beneath a floor and it is proposed for access panels to be overlaid, provided the panels are sound and level, Polyflor would recommend that a minimum 5.5mm Ply sheet as described in section 2.12.6 is installed over the access panel and adequately fixed.

A suitable smoothing compound should then be used to fill any joints and hollows as described in section 2.12.5.

2.13.6 Subfloors

In common with the installation of any type of flooring, the subfloor should not only be in sound condition, but also free of any contaminants, like oil, paint, preservative treatments in fact anything that may impair adhesion must be removed prior to installation. Other forms of marking, such as a permanent marker pen must also be removed. Similarly, no markings should be applied to the back of heterogeneous flooring.

Figure 2.1 Spiked screed roller

2.13.7 Surface Regularity

Close attention must also be paid to subfloor levelling. Level, smooth subfloors will vastly improve the aesthetic appearance of any finished floor covering installation. This is of particular importance when installing Homogeneous Vinyl Tiles; Rubber Tiles and Luxury Vinyl Tiles.

Polyflor's recommendation would be that the surface regularity should not deviate by more than 5mm when measured using a slip gauge or similar accurate measuring device under a 2m straight edge. When installing intricate Luxury Vinyl Tile; waterjet; and plain coloured sheet and tile designs a higher degree of surface regularity maybe required with deviation not exceeding 3mm when measured the same way as above.