Contents

Technical data
T 01 Why Change
T 02 Technical Data
T 03 Underfloor Heating
T 04 Joints

Post Installation Guidelines / O & M Manual Data
P 01 Drying Liquid Screed
P 02 Preparation of Liquid Screed
P 03 Post Installation Guidelines
P 04 Post Installation Products

Specification Guidance
S 01 Additional UFH Guidelines
S 02 Specification for Ground Floors
S 03 U-Value Chart 0.18
<table>
<thead>
<tr>
<th></th>
<th>Liquid Screed</th>
<th>Conventional Sand Cement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Productivity</strong></td>
<td>✓ Easily up to 2000m² per day</td>
<td>✗ Only 100 to 150m² per day</td>
</tr>
<tr>
<td><strong>How quickly can you walk on the floor?</strong></td>
<td>✓ Within 24 to 48 hours</td>
<td>✗ Should not be walked on for 7 days</td>
</tr>
<tr>
<td></td>
<td>✓ Self Curing</td>
<td>✓ Requires covering and curing</td>
</tr>
<tr>
<td><strong>Joints</strong></td>
<td>✓ 30-40 linear meters</td>
<td>✗ Can be laid in small bays of between 5-7 linear meters</td>
</tr>
<tr>
<td></td>
<td>✓ Following building construction joints</td>
<td></td>
</tr>
<tr>
<td><strong>Performance</strong></td>
<td>✓ Very low shrinkage</td>
<td>✗ Shrinks</td>
</tr>
<tr>
<td></td>
<td>✓ Minimal cracking</td>
<td>✗ Cracks</td>
</tr>
<tr>
<td></td>
<td>✓ Will not curl</td>
<td>✗ Curls</td>
</tr>
<tr>
<td><strong>Surface Finish</strong></td>
<td>✓ Easily achieves SR2 under BS 8204</td>
<td>✗ Dependant on contractor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>✗ Curls and cracks at joints</td>
</tr>
<tr>
<td><strong>On Insulation</strong></td>
<td>✓ No reinforcement required</td>
<td>✗ D49 or fibre reinforcement</td>
</tr>
<tr>
<td></td>
<td>✓ 40mm minimum thickness in commercial buildings</td>
<td>✗ 65mm minimum thickness</td>
</tr>
<tr>
<td></td>
<td>✓ 35mm minimum thickness in domestic buildings</td>
<td></td>
</tr>
<tr>
<td><strong>Average Drying Times</strong></td>
<td>✓ 40 days at 40mm</td>
<td>✗ 9 weeks at 65mm thickness</td>
</tr>
<tr>
<td></td>
<td>✓ Dependant on site conditions</td>
<td>✗ Dependant on site conditions</td>
</tr>
<tr>
<td></td>
<td>✓ Can be force dried after 7 days</td>
<td>✗ Must dry naturally</td>
</tr>
<tr>
<td></td>
<td></td>
<td>✗ Should be cured for one week</td>
</tr>
<tr>
<td><strong>Unbonded Floor Construction</strong></td>
<td>✓ Polythene laid directly to substrate minimal preparation</td>
<td>✗ D49 or fibre reinforcement</td>
</tr>
<tr>
<td></td>
<td>✓ No reinforcement</td>
<td>✗ 50mm minimum thickness</td>
</tr>
<tr>
<td></td>
<td>✓ 30mm minimum thickness</td>
<td></td>
</tr>
<tr>
<td><strong>Quality Control</strong></td>
<td>✓ Produced under BS EN 13454</td>
<td>✗ Often mixed on site by hand with poor quality control</td>
</tr>
<tr>
<td></td>
<td></td>
<td>✗ Inconsistent quality</td>
</tr>
<tr>
<td><strong>Installation</strong></td>
<td>✓ Self compacting</td>
<td>✗ Requires thorough compaction, one of main reasons of failure</td>
</tr>
<tr>
<td><strong>Environmentally friendly</strong></td>
<td>✓ Contains 98% recycled material</td>
<td>✗ Cement manufacture uses 1.5 tonnes/ton of cement</td>
</tr>
<tr>
<td><strong>Health &amp; Safety</strong></td>
<td>✓ Ergonomically friendly installation</td>
<td>✗ Very labour intensive</td>
</tr>
<tr>
<td></td>
<td>✓ No cement burns</td>
<td></td>
</tr>
<tr>
<td><strong>Underfloor Heating</strong></td>
<td>✓ High thermal conductivity</td>
<td>✗ Low thermal conductivity</td>
</tr>
<tr>
<td></td>
<td>✓ Reduced cover to heating elements</td>
<td></td>
</tr>
<tr>
<td><strong>Cost</strong></td>
<td>In most applications Liquid Screed gives cost/time savings over traditional hand applied sand and cement screed.</td>
<td></td>
</tr>
</tbody>
</table>
Description
Liquid SCREED flowing screed is a blend of synthetic Calcium Sulphate binder, special additives and selected aggregates mixed with clean potable water to produce a pumpable self smoothing, flowing screed (manufactured to BSEN 13813:2002).

Uses
Liquid SCREED is designed to provide a smooth level surface in both commercial and domestic buildings prior to the application of floor finishes. It can be used bonded, unbonded or floating. It is particularly suitable for use with under floor heating.

For advice on specifications and for proprietary systems contact screed.it on the number below.

Key Features
• Increased productivity - 2000m²/day can be easily achieved
• Self compacting
• Self curing
• Can be walked on in 24-48 hours
• Can be loaded after 7 days
• Extremely low shrinkage – does not curl and minimises the risk of cracking
• Avoids the need for reinforcement
• Significantly reduced thickness when compared to traditional sand – cement screed
• Large bay sizes of up to 1000m² depending on application (heated floors 300m²)
• Ideal for use with under floor heating
• Can be force dried as early as 7 days after application
• Weight saving as a result of thinner section
• Dries at a rate of 1mm per day up to a screed depth of 40mm in good drying conditions
• Easily achieves SR2 finish as described in BS8204
• Protein free – cannot harbour harmful bacteria
• Non combustible (tested to BS476 Part 4)
• Minimal thermal expansion (0.012mm/mK)
• Excellent thermal conductivity
• Environmentally friendly

Technical Data
Appearance/Colour: Off-white fluid mortar
Water demand: 13-18 % b.w
pH: > 10
Wet Density: 2200 kg/m³
Dry Density: 2000 kg/m³

Typical Screed Properties:
Compressive Strength: CA25 N/mm²
Flexural Strength: F4 N/mm²

Minimum Application Thickness
Bonded: 25mm
In contact with substrate: 30mm
Unbonded: 30mm
Floating Commercial: 40mm
Floating Domestic: 35mm
Underfloor Heating: 25mm minimum (30mm nominal) cover to pipes, heating elements.

Delivery
Liquid SCREED is supplied via a concrete plant in truck mixers or transmix trucks or as a bagged material.

Health & Safety
Some of the components of this product may be hazardous during mixing and application. Please consult the relevant Health & Safety Data Sheets, available on request.

Environmental Benefits
Nominal recycled content of 36%
(Gylvon binder 98%)
VOC free
100% recyclable
**Description**

Liquid SCREED is a blend of synthetic Calcium Sulphate binder, special additives and selected aggregates mixed with clean potable water to produce a flowing pumpable screed (manufactured to BSEN 13813:2002) which is ideal for application over warm water and electric under floor heating systems.

**Key Features**

- Increased productivity – 2000m²/day can be easily achieved
- Self compacting
- Self curing
- Can be walked on in 24-48 hours
- Can be loaded after 7 days
- Extremely low shrinkage – does not curl and minimises the risk of cracking
- Avoids the need for reinforcement
- Significantly reduced thickness when compared to traditional sand – cement screed
- Large bay sizes of up to 1000m² depending on application (heated floors 300m²)
- Ideal for use with under floor heating
- Can be force dried as early as 7 days after application
- Weight saving as a result of thinner section
- Dries at a rate of 1mm per day up to a screed depth of 40mm in good drying conditions
- Easily achieves SR2 finish as described in BS8204
- Protein free – cannot harbour harmful bacteria
- Non combustible (tested to BS476 Part 4)
- Minimal Thermal expansion (0.012mm/mK)
- Excellent thermal conductivity
- Environmentally friendly

**Additional Features**

- Fully encapsulates heating conduits
- Elimination of voids & maximised thermal efficiency
- Rapid response and controllability
- Reduced depth allows more insulation

**Typical Schematic Installation**

**Key Installation Points**

- Pipes or cables must be securely fixed to prevent floatation and lifting during application of the screed
- Pipes should be pressurised in accordance with BS 1264:2001:4
- Minimum cover to pipes or cables must be 25mm (nominal 30mm)
- If required surface laitance must be removed prior to commissioning of under floor heating
- Heating must be commissioned and run in accordance with manufacturer’s instructions prior to application of the floor finish

Expansion joints should be used between different heating zones and at door thresholds.

**Surface Temperature**

Temperature across screed surface 80mins after turning underfloor heating on.
Liquid Screed is suitable for application to most types of sub bases demonstrating an excellent degree of dimensional stability (max shrinkage/expansion on drying of 0.02%) when compared to traditional sand cement based screeds.

### Maximum Bay Length – Unheated

<table>
<thead>
<tr>
<th>Condition</th>
<th>Maximum Bay Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floating on Insulation</td>
<td>40m</td>
</tr>
<tr>
<td>Unbonded on Polythene/Visqueen</td>
<td>40m</td>
</tr>
<tr>
<td>Bonded</td>
<td>40m</td>
</tr>
<tr>
<td>Underfloor Heating</td>
<td>40m</td>
</tr>
</tbody>
</table>

### Maximum Bay Sizes

<table>
<thead>
<tr>
<th>Condition</th>
<th>Maximum Bay Sizes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floating on Insulation</td>
<td>1000m²</td>
</tr>
<tr>
<td>Unbonded on Polythene/Visqueen</td>
<td>1000m²</td>
</tr>
<tr>
<td>Bonded</td>
<td>1000m²</td>
</tr>
<tr>
<td>Underfloor Heating</td>
<td>300m²</td>
</tr>
</tbody>
</table>

### Aspect Ratio

<table>
<thead>
<tr>
<th>Condition</th>
<th>Aspect Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unheated</td>
<td>Max 8 : 1</td>
</tr>
<tr>
<td>Heated</td>
<td>Max 6 : 1</td>
</tr>
</tbody>
</table>

### Joint Movements

The edge strip recommended for use with Liquid Screed is a minimum 8mm (10mm with under floor heating) foamed polyethylene with an attached polythene skirt, this thickness relates directly to the maximum allowable positive movement within the screed.

40m x 0.02% 8mm

As with all types of screed a joint must be formed above all structural movement joints.
Joint Movements Continued
On larger pours the following guidelines may be of use when considering the layout of any day-work or bay joints during screed placement.

Normal Screeding Conditions
A bay joint is required at this position as the total screed area is in excess of 1000 m².

NB: As with all types of screed a joint must be formed above all structural movement joints.

Screeding Corridors
Please refer to aspect ratio table.

Underfloor Heating
Screed It recommends that the maximum bay size when used in conjunction with for underfloor heating is 300 m². However it is important to note that a joint should be present between two independent heating circuits and door thresholds to allow for thermal movement within the screed and differential temperature gradients.

NB: Consideration should be given to additional joints between heated and unheated areas and areas of high thermal or solar gain.

It is also necessary to note that the shape of the room can also affect the requirements for bay joints. The following guidelines highlight our recommendations with regards to placement of joints in relation to the shape of the room and area screened.

No joint required as the proportional section is the main bay and the corner reflects into the main bay.

Joint required as the corner reflects outwards.
Expansion joints can be made using pre-formed 8 or 10mm closed cell polyethylene foam with a self adhesive t-bar base. Joints may be needed due to large areas, or in between under floor heating circuits, this detail is particularly well suited to under floor heating as it eliminates cutting the screed.

- Insulation, DPM and Edge detail installed as normal
- Joint strip attached to DPM where expansion joints are required using self adhesive base, they should also be secured using additional screed tape to improve bond
- Where the strip meets either walls or door frames these joints should be sealed using tape
- Install screed as per Liquid Screed Installation Guide and NBS M13 Specification
- Once the screed has cured the joint strip can be trimmed to screed level using a suitable knife

Contraction joints can be cut into the screed following it’s installation.

- Insulation, DPM and edge detail installed as normal
- Install screed as per Liquid Screed Installation Guide and M13 Specification Guide
- Saw cuts should be formed as early as possible following the screed being installed (2-3 days)
- Saw cuts should be made to half the screeds depth using a floor saw with suitable blade
- Saw cuts should be a minimum of 5mm wide
- Joints can be filled using a flexible epoxy sealant
Drying Liquid Screed

In common with other screeds it is very important that good drying conditions are provided as soon as it is appropriate.

For Liquid Screed adequate protection from rapid drying or draughts should be provided for the first 48-72 hours but thereafter the relative humidity of the building should be low to allow moisture release from the screed and facilitate drying. Failure to provide the desired conditions can prolong screed drying times considerably and may lead to delays in the construction schedule.

**Screeed drying time**

Under ideal drying conditions (a warm, well ventilated room) Liquid Screed dries at a rate of 1mm/day up to a thickness of 40mm and then at a rate of ½mm/day for thicknesses above this.

**Example:**

50mm Liquid Screed drying time: (40mm*1 day) + (10mm*2days) = 60 Days (2 months).

**NB:** Drying of screeds and can be greatly influenced by individual site conditions.

The above example is for guidance only.

Drying times can be reduced by the provision of good ventilation, open windows and doors in good weather, removal of laitance as recommended, the use of dehumidifiers and by force drying of the screed using under floor heating.

**Assisted drying time**

**Dehumidifiers:**

Dehumidifiers can be used as early as 72 hours after the placing of Liquid Screed to assist with drying. It is important that a closed system is employed to ensure that any moisture extracted from the environment during operation is removed. Any water collected should be removed regularly.

**Force drying**

- Force drying of a Liquid Screed can begin as early as 7 days following installation of the screed by various methods. Commissioning (heating & cooling procedure) of under floor heating systems. Set flow temperature to 20-25°C, maintain for a minimum of 3 days and then gradually increase the temperature in Max 5°C increments to maximum operating temperature. This should be maintained for a further 7 days (water temperature should not exceed 55°C for screeds), prior to returning to ambient temperature again in Max 5°C increments.

- Space Heaters & Dehumidifiers in combination. Fossil fuel fired heaters (e.g. gas heaters) must be avoided as they will raise humidity

- Specialist drying mechanisms These include vacuum dewatering, cocooning and microwave technology. These procedures should only be carried out by specialist contractors

**Important**

After drying the screed, the residual moisture content must be determined using one of the approved test methods to demonstrate suitability for acceptance of floor finishes.

**NB:** Drying of screeds and can be greatly influenced by individual site conditions.
The preparation of Liquid Screed ready for floor coverings can be split into four areas:

- Sanding
- Moisture Testing
- UFH Commissioning
- Priming

These notes are a brief outline, further detail can be provided on request.

**Sanding**

Liquid Screed is available in both a traditional mix which can produce a laitance and a LL (Low Laitance mix) which uses a special additive to prevent laitance forming. As with all flooring substrates, both mixes will require a light sanding to either remove laitance and/or create a surface key.

**Moisture Testing**

As with all screeds, in good conditions Liquid Screed has a natural drying time of 1mm per day up to 40mm and 0.5mm after that, drying times can be greatly affected by site conditions so it is advised that the atmosphere is kept as warm and dry as possible. Commissioning the UFH and/or using dehumidifiers can greatly improve the figures above, prior to coverings the screed moisture must be tested using either a hair hygrometer, carbide bomb or oven test and be below 75% RH (0.5% Moisture).

**NB:** It may be possible to use Gypsum based products at 85% RH, manufacturers must be consulted.

**Underfloor Heating Commissioning**

Where under floor heating is used this must be commissioned and run prior to floor coverings regardless of how dry the screed maybe, this is in line with CFA, TTA, Vinyl and Tile Manufacturers guidelines. This process forces additional moisture from the screed and conditions it to thermal movement prior to coverings, typically the commissioning cycle is 21 days and can be started as early as 7 days Liquid Screed.

**Priming**

As with all screeds, Liquid Screed will require priming prior to application of adhesives for two reasons:

1) To seal the porous surface to prevent suction of moisture from the adhesive or smoothing compound.
2) To form a barrier between the screed and any cement based smoothing compound or adhesive that may be used.

Primers are generally acrylic dispersion or water based epoxy based and generally perform best when used as a two coat system. However the manufacturers of these primers should be consulted for advice prior to use.
Liquid Screed is a flowing pumpable calcium sulphate based screed designed to provide a smooth level surface in both commercial and domestic applications prior to the application of floor finishes.

Suitable for application to all types of sub floor Liquid Screed is ideal for application as a floating floor on insulation, over under floor heating (both electric and warm water systems), and cooling systems on thermal insulation and on resilient layers in acoustic applications, for large areas to reinstate the floor level.

Following installation the environment must remain sealed for 2 days. The screed should be protected from direct sunlight and frost during this time.

After this period good drying conditions should be maintained, increase ventilation, and if possible increase room temperature to minimise drying time.

Do not cover with polythene.

Storage of materials on the screed surface, accidental exposure to water, humid or cold environments will all delay drying.

After 7 days the screed can be force dried.

When installed over under floor heating and cooling systems the screed must be heated prior to application of floor finishes.

This can commence as early as 7 days after installation, commissioning of under floor heating should be carried out in accordance with BS1264:2001 part 4, clause 4.4 and in line with the manufacturers recommendations, heating should be gradual, in 3-5°C increments and at no time should the water or cable temperature exceed 50°C.

The system should be switched off for a minimum of 48 hours (2 days) prior to determination of the moisture content and installation of floor finishes.

Prior to installation of floor coverings the moisture content of the screed should be determined using the hair hygrometer in accordance with BS8203.

The Contract Flooring Association (CFA) and the Tile Association have recommendations relating to installation of floor coverings on calcium sulphate screeds. These bodies should be consulted for further information.

The surface of the screed should be free from dust, skin or other contaminants and should be sealed with an appropriate primer prior to the application of subsequent adhesives or levelling compounds (consult the manufacturer for suitable products and recommendations for installation).

Both calcium sulphate and cement based products are suitable, however in the latter case the Agilia Screed A should be dry and the manufacturers recommended primer used prior to application.
From time to time we are asked about primers, sealers, tile adhesives, levelling compounds etc. Primers and sealers will usually be of the acrylic or epoxy type. In all cases, advice should be sought from the manufacturer.

Levelling compounds and tile adhesives, can be based on cement or calcium sulphate. Those products based on cement are usually part of a system which incorporates a sealer/primer designed to separate the cement from the calcium sulphate contained within the Liquid Screed. Those levelling compounds based on calcium sulphate usually do not need a sealer but will still require a primer in order to prevent the moisture being drawn into the screed from the levelling compound/tile adhesive too quickly. (Often referred to as ‘suction’.) Again, in all cases, advice should be sought from the manufacturer.
In addition to the notes regarding ground and upper floor design there are important additional considerations for screed specification.

1. **Screed Thickness** – Please ensure your specification provides the correct amount of cover to the pipe work specified (Minimum 25mm). Although we require 25mm we try to avoid thick sections of screed as the thicker the section the longer the drying times and slower the UFH response.

2. **Bay Sizes** – Please ensure that maximum bay sizes of 300m² and maximum bay length of 20 linear metres are not exceeded.

3. As per British and European Standards movement joints need to be allowed for in the screed in the following areas:
   a. As per bay sizes above
   b. At each doorway and in between independent heating circuits
   c. Between heated and non-heated screed sections

4. **Force Drying** – Please include in your specification that the screed can be force dried to reduce drying times for floor coverings, dehumidifiers can be used after 48 hours with the UFH being commissioned at 7 days.
   a. Heating should be run at 20 degrees for 48 hours
   b. And brought up 5 degrees per 24hrs up to a maximum of 55 degrees
   c. The system can be run for as long as required to dry the screed
   d. System should be brought down 5 degrees per day to the 20 degree starting point
One of the major benefits of Agilia Screed A is that it can be laid significantly thinner than traditional screeds allowing more of the floor zone to be saved for insulation, this is especially important as building regulations and green building codes have changed and require higher U-values.

It is now possible to achieve these increased U-values with no need for costly increases to floor zone thickness.

To decide on the specification we first need to decide what depth of screed will be required for the application, (please see guide below).

<table>
<thead>
<tr>
<th>Application Type</th>
<th>Type of Build</th>
<th>Minimum Depth Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floating</td>
<td>Residential</td>
<td>Minimum 35mm</td>
</tr>
<tr>
<td>Floating</td>
<td>Commercial</td>
<td>Minimum 40mm</td>
</tr>
<tr>
<td>Floating</td>
<td>UFH System</td>
<td>Minimum 25mm (30mm nominal) cover to pipe work</td>
</tr>
</tbody>
</table>

A general rule of thumb is 40mm for none heated floating floors and 50mm for heated floating floors, the remainder of the floor zone can now be used to achieve the required U-value.

How to Calculate a U-value

For a ground floor construction we need to establish the perimeter and area ratio to allow us complete a U-value calculation, which is the total external linear perimeter divided by total area of the ground floor, for example if the floor had a 15.3m perimeter and an area of 55.46m², the calculation will simply be 15.3/55.46 = 2.75 perimeter area ratio).

NB: The lower P/A figure the easier it is to achieve the required U-value.

NB: Only exposed perimeter walls should be measured, walls to adjoining insulated properties do not need to be taken into account.

Now we have the P/A figure for your project. We now need to establish what the required U-value for the building should be. Confirmation can be sought from either local building control or the projects Breeam Assessor.

We can now use both figures (P/A Value and Required U-value) in conjunction with the tables below.

For different insulation types and performance at different depths, there are numerous products available on the market all with varying strength and thermal properties.

Example:
Based on the 0.275 P/A ratio above for a building that requires 0.22 U-value, you can choose from 90mm EPS100 or as little as 55mm Philonic Polyurethane.

We can look at the U-value in two ways, firstly achieve the required U-value with the cheapest insulation possible or choose to use a higher grade insulation and make a higher than required U-value.

For further assistance or to request a completed specification call 0870 336 8258.
EPS stands for expanded polystyrene and is polystyrene beads that have been expanded and compressed together to form a board, the more the beads are compressed the stronger the insulation becomes, we would suggest using at least a 100 KPA board. EPS is available in two grades; White and Platinum, the only difference being the thermal performance of the product.

XPS stands for extruded polystyrene which is a different process of manufacture than the expanded, and as such gives you a stronger insulation with a higher thermal performance.

Polyurethane is a higher performing insulation product that is often foil backed, it offers a significant thermal increase over the polystyrene products.

Philonic Polyurethane is a modified polyurethane which offers a slightly higher performing board which can be of used for very strict U-values or on limited floor zones.

<table>
<thead>
<tr>
<th>Strength</th>
<th>P/A ratio's</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.00</td>
</tr>
<tr>
<td>EPS 100</td>
<td>0.035</td>
</tr>
<tr>
<td>EPS 100 Platinum</td>
<td>0.03</td>
</tr>
<tr>
<td>XPS</td>
<td>0.029</td>
</tr>
<tr>
<td>Polyurethane with foil</td>
<td>0.023</td>
</tr>
<tr>
<td>Philonic Polyurethane with Foil</td>
<td>0.021</td>
</tr>
</tbody>
</table>
EPS stands for expanded polystyrene and is polystyrene beads that have been expanded and compressed together to form a board, the more beads that are compressed the stronger the insulation becomes, we would suggest using at least a 100 KPA board. EPS is available in two grades; White and Platinum, the only difference being the thermal performance of the product. Manufacturers of these boards include, Jablite, Kay Metzeler, Springvale, Aeroboard, Quinntherm and many more.

XPS stands for extruded polystyrene which is a different process of manufacture than the expanded, and as such gives you a stronger insulation with a higher thermal performance. Manufacturers of these boards include Knauf and Cellecta.

Polyurethane is a higher performing insulation product that is often foil back, it offers a significant thermal increase over the polystyrene products. Manufacturers include Celotex, Kingspan, Quinntherm and Xtratherm.

Philonic Polyurethane is a modified polyurethane which offer a slightly higher performing board which can be of use for very strict U-values or on limited floor zones. Manufacturers include Kingspan.