SCREEDS – FOR ROOFING

INTRODUCTION

Screeds provide a suitable surface to receive the waterproofing, and can also be used to achieve falls and cross falls when concrete slabs and precast concrete units are installed flat. In addition some screeds can provide a level of thermal insulation and contribute to the U-value of the roof.

Sand and cement screeds have a high thermal conductivity and do not significantly contribute to the overall thermal transmittance value of the roof.

Aerated screeds and lightweight aggregate screeds bound by cement or bitumen have a lower thermal conductivity and will make a small contribution to the U-value when dry. The main insulation will normally be added above the screed.

Aerated and lightweight aggregate screeds are normally laid by specialist contractors and their advice and recommendations should be followed. These screeds should also be protected from damage by other trades.

Wet screeds which contain large quantities of water cannot be covered by the waterproofing membrane on the same day. A period of time is necessary to allow for drying and curing so that the top surface is suitable to accept the waterproofing. If the screed cannot be protected from rain, drainage holes should be formed in the deck.

SCREEDS

SAND AND CEMENT SCREEDS

Sand and cement screeds are normally mixed in the ratio 4:1 and the surface should be finished with a wood float.

The screed should be laid direct to the deck to obtain a good key. It should not be laid continuously but in areas not exceeding 10m², to reduce the incidence of cracking due to drying and shrinkage.

The screed contains considerable amounts of water and the surface should be adequately cured and dry before the roofing specification is applied.

These are traditional screeds and are suitable for all applications, provided they are specified correctly. The biggest drawback is the drying time; BS 8203 estimates the drying time for a sand cement screed as one day for each millimetre of screed thickness up to 50mm thick.

Unbonded cement sand screed

The screed thickness should not be less than 50mm; therefore, to allow for deviations in the finished levels, the specified design thickness should be a minimum of 70mm. However, BS 8204-1 emphasizes that there is a high risk of screed curling with unbonded and floating levelling screeds. In order to minimise this, the screed should be either reinforced across the joints or made 100mm or more thick.

AERATED SCREEDS

Portland cement, water and a foaming emulsion are combined to produce a cellular material which offers a hard surface when dry.

The insulation value should only be taken into account when it is reasonable to assume that the screed will be efficiently drained and dry.

LIGHTWEIGHT AGGREGATE SCREEDS

Suitable lightweight aggregates are formed from expanded clay or sintered pulverised fuel ash, bonded with a cement binder.

The material must be laid soon after mixing otherwise the cement binder may dry and not bond the aggregate together. A 13mm sand and cement topping is necessary to give a smooth level surface for the roofing specification. Walk boards must be used when applying the topping to prevent displacement of the aggregate.

The insulation value should only be taken into account when

it is reasonable to assume that the screed will be efficiently drained and dry.

LYTAG® SCREEDS

A typical lightweight aggregate screed is lytag® of which the main ingredient used in the manufacture of lightweight aggregate is pulverised fuel ash (fly ash). This is the waste material produced from electricity production in coal-fired power stations. The aggregate is called 'sintered pulverised fuel ash lightweight aggregate', more commonly known as Lytag®.

It comes in pellet form and was used to reduce weight loading in concrete structures. Typical particle density is from 1350-1650kg/m³ compared to an in-situ concrete slab of 2400Kg/m³.

MASTIC ASPHALT SCREEDS

Mastic asphalt screeds are manufactured from selected bitumen's, limestone filler and specially graded aggregates. It can be installed to create drainage falls, level out uneven substrates, and provide a stable base for the waterproofing system.

Designed for use in in-situ, precast concrete bases, and is suitable for warm roof, inverted roofs, all green roofs, balcony/terrace application walkways, footbridges and car park/HGV service decks.

Grades:

There are 3 grades of material, light, medium and heavy.

Description	Recommended thickness	usage
Light duty	10 – 25mm	Roofs, balconies and walkways
Medium duty	20-40mm	Roofs, balconies and walkways
Heavy duty	35mm + maximum single coat thickness of 60mm)	As above + car parks and HGV service decks

Heavy duty blocks will require the site addition of 40-45% of 10mm size course aggregate prior to the installation.

It is installed using traditional mastic asphalting techniques, when creating drainage falls; tapered gauges should be used to ensure that the thickness and falls are correct. Where necessary it can also be laid in multiple layers to achieve the required depth.

Typical application of a mastic asphalt screed application

Where being used over concrete or sand cement screed, the substrate must first be primed. This is particularly important where being used to levelling out of uneven surfaces.

Where used over timber/plywood based substrates a separating layer of sheathing felt will be required.

As with any mastic asphalt, there is always the potential for some blowing to occur, which can be controlled by stabbing and making good. However, if the blowing is uncontrollable, then a glass fibre tissue separating layer should be adopted.

The benefits with mastic asphalt screed is it drying time, as it contains no water content any drying time is greatly reduced over that of a traditional sand cement screed.

Mastic asphalt screeds, a minimum of 13mm thick could also be used as an effective vapour control layer.

BITUMEN SCREEDS

The lightweight aggregate consists of expanded clay bonded together with a bitumen binder. This screed does not require a topping, only the passage of a light roller before the application of the waterproofing; this is not to compact the screed but to form a level surface.

It is recommended that this type of screed is laid with an underlay of bitumen roofing. This will allow a temporary seal to be formed between the underlay and the waterproofing

to fully protect the screed from overnight rain.

OTHER

CALCIUM SULPHATE PUMPABLE SELF-SMOOTHING SCREEDS

These screeds can be laid as bonded or unbonded. They can be laid in much larger areas than cement sand screeds, around 2000m^2/day. However, they must not be used with reinforcement because the calcium sulphate is corrosive to steel in damp conditions. These screeds are also generally not suitable for use in damp conditions or where wetting can occur.

These screeds are all proprietary products and therefore vary from one supplier to another, the guidance given here is therefore generic and the manufacturer should be consulted before specifying. If they are intended to be used as a wearing (structural) screed then the manufacturer should be consulted.

EXPANDED CLAY BASED PRODUCTS

These types of screed can be used to create very lightweight, extremely strong, stable, durable insulating roof falls and screeds.

- **Ultra-lightweight concretes and lightweight closed-structure screeds** can be used to create roof falls or thermal insulation, or screeds on which the waterproofing membrane or roof finish can be laid directly.

- **Ultra-lightweight pervious concretes** can be used for roof falls, or for thermal insulation or fill, including at deep thicknesses. The surface of the expanded clay should be levelled with a screed before applying the waterproofing membrane or laying the roof finish.

Expanded clay can also be used in association with other insulating materials for complete high-performance technical solutions on warm roofs, inverted roofs, and any type of supporting slab (timber, steel decking, concrete, insulating panels, etc.);

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