LYTAG®
lightweight solutions

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CI/SfB (-A) (23) Pq7	

Technical Manual – Section 8
Rapid Drying Lightweight Screeds

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Rapid drying lightweight screeds Introduction

Many locations require a lightweight screed mix that dries and hardens more rapidly than ordinary sand:cement mixes so that floorings can far be installed as soon as possible. Lytag and Ardex UK limited have combined their technical resources to provide a lightweight rapid drying and hardening screed using Ardurapid 35 cement so that resilient and other floorings can be applied 24 hours after screed installation. A brief outline of the application details is given below. Please note that full technical data on Ardurapid 35 cement, and guidance on its use with Lytag, can be obtained from Ardex UK Limited.

General

Ardurapid 35 cement is manufactured by Ardex UK Limited under their quality management system, which complies with BS EN ISO 9001: 2000 and is monitored by BSI.

Lightweight, rapid drying, composite screeds can be produced in two ways using Lytag with Ardurapid 35 cement. The advice given below is for 4/8mm Lytag lightweight aggregate mixed with Ardurapid 35 cement. The dry bulk density of Lytag is about 750kg/m^3, ordinary sand/pea gravel is about 1650kg/m^3.

The 4/8mm Lytag aggregate is available either in bags (approximately 15kg), or loose in bulk loads. The Lytag is usually pre-damped for bagging handling, so you must ensure that DRY Lytag is specified and supplied.

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Application

A ‘fine concrete’ lightweight screed is used, where part of the sand is replaced with 4/8mm single sized Lytag, as when using 10mm single sized normal aggregate.

A typical mix would be 1 part Ardurapid 35 cement, 3 parts screeding sand and one part 4/8mm Lytag by weight. The Ardurapid 35 cement should be blended with the sand and water in a forced action mixer and then the Lytag added. This gives a screed density of about 1800-1900kg/m3 (normal Ardurapid 35 cement/sand density is approximately 2000kg/m3).

Weight per square metre at 50mm thickness: Normal screed 100kg
With Lytag 90kg

The mixed sand: cement can be laid as a bonded or unbonded screed using the design parameters for normal cement and sand screeds i.e. screed thickness, slab preparation, damp proof membranes, etc. With the 4/8mm Lytag it may not be possible to obtain as closed a surface as with conventional cement:sand screed and the lightweight aggregate may increase the indentation value obtained with the BRE screed tester.

A ‘no-fines’ screed is made using a 1:4 mix by weight of Ardurapid 35 cement with 4/8mm Lytag (equivalent to 1:8 by volume) i.e. a 25kg bag of Ardurapid 35 cement with 4 x 25kg bags of 4/8mm dry Lytag. The no-fines base coat should be mixed in a forced action mixer e.g. a forced action paddle mixer and the no-fines base coat is usually laid as a bonded screed.

Using the Ardurapid 35/Ardion 51 as a cement grout to prepare the concrete surface.

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Once the no-fines base layer has been ruled off to the required level, a 15mm to 20mm topping layer of 1:4 Ardurapid 35 cement:sand screed is applied on top, fresh on fresh (monolithically). Place the mixed topping evenly over the Lytag base coat to provide a layer 15mm (nominal) deep and tamp into place to ensure full compaction. Strike off the surface to the correct level and finish with a steel trowel to fully close the surface. The minimum thickness of the no-fines base coat is 25mm, there is no restriction on the maximum thickness of the no-fines base coat.

If the application of the topping is delayed beyond the recommended period, the exposed surface of the base coat should be grouted, using the Ardurapid 35/Ardion 51 cement grouting slurry technique, prior to laying the topping. Avoid excess grout flowing down into the voids of the base coat.
Where the topping layer has to be subjected to site traffic after installation the surface should be protected as recommended in BS 8204-1. If it is considered necessary to improve the strength of the topping layer Ardion 100 additive can be incorporated in the topping mix at the rate of 2.5kg Ardion 100 per 25kg Ardurapid 35 cement.

The Lytag has high initial absorption and therefore, to obtain a rapid drying no-fines screed, use dry Lytag. The Ardurapid 35 cement should be initially mixed with the maximum amount of water (11 litres/25kg Ardurapid 35 cement) and then the dry Lytag should be added. The no-fines Lytag/ Ardurapid 35 screed should be placed into position as soon as it is mixed sufficiently to ensure that the Lytag is coated with the Ardurapid 35 cement slurry.

The density of no-fines is 1100-1200kg/m^3, with the normal screed density of 2000kg/m3 for the topping layer.

Screed weight per square metre at 50mm thickness 35mm no-fines Lytag 38.5kg
15mm topping 30.0kg
Total weight = 68.5kg.

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Lytag, as with most lightweight aggregates, has a high initial absorption and the procedure of adding the dry Lytag to the Ardurapid 35 cement and water mix will blind the Lytag surface and minimise the absorption of moisture by the Lytag. Note that the mix of no-fines Lytag screed is most workable when freshly mixed and may gradually stiffen as the Lytag absorbs water. The Ardurapid 35 cement and water mix should coat the Lytag so that the
aggregate particles are glued together by the cement paste when laid as a screed but the cement and water grout should not drain to the base of the no- fines screed.

Density

Lytag 'no fines' base coat with Ardurapid 35 cement:	1100-1200kg/m3 (density of dry screed)
Topping cement with Ardurapid 35	2000 kg/m3 (density of dry screed)
Lytag 'fine concrete' lightweight screed mortar	1800-1900kg/m3 (density of dry screed)

Hardening and Drying Times

Topping	Light foot traffic Site traffic	6 hours 24 hours

Drying times for laying floor finishes - 1 day regardless of thickness of base coat and topping.
Note: The topping will provide a compressive strength considerably in excess of the lightweight base coat, however, its main purpose is to provide high early strength to distribute the load and improve short and long-term durability.

Thermal Conductivity

The rapid drying composite screed will give an improved thermal insulation value because of the lower thermal conductivity of the Lytag base coat. The values achieved will be in the same range as for the same thickness of composite screeds made with normal Portland cement of a similar density.

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