

DENSIPHALT VERSUS CONCRETE

What is Densiphalt?

Densiphalt is a grouted macadam comprising an open graded asphalt that is flooded with high strength microsilica based mortars. The open graded asphalt is mixed to a design mix at a local asphalt plant and delivered to site in tipper trucks. It is placed via traditional paving techniques.

The mortars are delivered in 1 tonne bags and mixed via a continuous flow putzmeister pump machine. The mortar is mixed for a certain amount of time to achieve correct viscosity then flooded via a large hose onto the asphalt matrix.

History

Densiphalt is a Danish product manufactured under license by a company called Densit APs. The product has been used world-wide for over 25 years now in a wide variety of market sectors.

It has been used in the UK for circa 12 years with an extensive and impressive list of clients available for perusal at any time.

Constituent elements

Refer to technical data sheets

How does the whole construction thickness fit together?

Densiphalt can be laid at depths of 30mm upwards (typically maximum depth used is 40mm). Densiphalt is the top layer of the pavement that is supported by a basecourse layer. The basecourse layer can vary dependent on environment and loadings, internal or external applications. Preferred basecourse materials to support the Densiphalt topping are high modulus macadam basecourse or Foamix recycled binder course. CBM bases are ideal for use for large internal areas. The Densiphalt pavement structure (DPH + Basecourse) is laid onto varying depths of Type 1 stone/capping dependent on the CBR value of the sub-grade.

Foam mix base course and others

As attached

Choice of sub base

Use of CBM prevalent in Continental European Practice

Principals of Design

Design methodology attached

Where is Densiphalt used?

Airports

Ports

Lorry marshalling areas

Service yards

Access roads

Bus stations / depots

Waste management facilities

Car parks

Indoors for warehouse floors

Anywhere that concrete is conventionally used

Pros and Cons of Densiphalt vs. Concrete

List non-financial advantages and disadvantages

Aspect	Concrete	Densiphalt
Experience Base	Great	Limited in UK
Placing & Construction	Conventional placement of concrete with additives within formwork over a prepared base	Densiphalt filler, a form of micro-silica is poured into an open graded asphalt.
Curing time	At least a week preferably longer	24 hours
Non rectangular of indented planforms	Easy to form with wet workable concrete	Difficult to form with Densiphalt
Durability in general	Good	Good
Overall service life	25 years	25 years
Time to first repair	3-5 years	??
Ease of repair	Difficult to repair unless cut out and replaced	Easy to repair
Burden of repairs	Frequent maintenance and repair required after 3-5 years particularly in geological settings where there is ground movement	Held to be much less than concrete and this has been backed up by studies in airports and lorry marshalling areas
Acceptance of ground movement and suitability for brownfield sites	Fair	Very good
Acceptance of recycled aggregates, glass, asphalt planings	Becoming common as aggregate tax affects cost of new aggregates	Open to use of recycled aggregate particularly in base course with foam

and so on		mix process
Surface appearance when new	Very good, providing that the mix has been controlled and mixing plant has delivered consistent mixes with same aggregate source (these provisos are sometimes difficult to achieve in practice)	Can appear patchy as mortar spreads up to a greater or lesser extent in different parts of the area

Aspect	Concrete	Densiphalt
Surface appearance in 3-5 years	Usually there are signs of deterioration after carbonation and discolouration	Generally good Wears exceptionally well
Long term surface appearance	Not usually good	Not a great experience base but generally holds up better than concrete
Degradation of joints	Degradation of joints arises is expected	Not relevant as Densiphalt is semi flexible and jointless
Overall Construction thickness	Can vary subject to environment and loading – 150mm – 250mm in general	Typically Densiphalt delivers shallower construction depths

Financial

First Cost

Not typically cheaper than concrete as a substitute material over a committed construction thickness

Densiphalt is cheaper if thought about ab initio

Cost in service

Densiphalt considered cheaper in two independent studies

Summary

Densiphalt is better in reclaimed sites and in brownfield developments.

Less overall construction thickness so savings there.

While it doesn't look as shiny and sparkly to begin with, after 3-5 years it looks better than concrete.

Cheaper to maintain.

Saves some construction time.

You can run on it straight away and don't have to wait for curing.