

The best kept secret on the roads

Continuing a series of exclusive articles for *Highways Magazine* from the Road Surface Treatments Association (RSTA), chief executive Howard Robinson talks about a well-kept secret in the industry and how its use can lead to longer lasting roads

Grouted macadams are products evolved from a simple idea: to alter the physical characteristics of a new running surface to meet a specific need and to make the surfacing super strong and tough with high durability. The two variants are cementitious and asphaltic grouted. Cementitious grouted macadams originated in France in the early 1950s. Since then the use of these materials has spread to other countries, entering the UK market in the mid 1960s. The asphaltic grouted macadam was developed in the UK in 1993 for the national road network to provide increased flexibility and performance.

Grouted macadams offer an innovative solution to problems which conventional asphalts struggle to cope with. Yet despite having BBA certification and latterly HAPAS certification these products have remained a well kept secret for many years and rarely make the headlines. For example 120,000m² was laid on the new London Gateway Container Terminal in 2013.

In total, more than six million square metres of asphaltic grouted macadam has been laid on most local authority roads across the UK



Pouring the grout



Spreading the grout



Finished job



Applying the cementitious grout

- and likewise millions of square metres of cementitious grouted macadam.

How is it installed?

The process involves laying an open graded asphalt surface course typically 30 to 50mm thick with controlled air voids, then applying a liquid grout to fill the voids in the asphalt. The surface course is vibrated to ensure the grout penetrates to the required depth and the surface is normally brushed to expose the coarse aggregate, ensuring adequate texture depth and skid resistance. The grout can either be a liquid asphalt or liquid cementitious.

Where can it be used?

Asphaltic grouted macadam obtained HAPAS certification in 2006 and can be used on most residential and rural roads. It has a large loyal following for the resurfacing of concrete carriageways as it offers a fully impervious flexible covering, ensuring protection of the underlying structure and comes with a joint treatment package.

Cementitious grouted macadams have been BBA certificated since 1986 and HAPAS certificated since 2006. They are laid where traffic loading is extremely heavy and concentrated or where there is spillage of fuel or industrial chemicals. Instances where they would be laid within the public road network would include bus infrastructure works, roundabouts, junctions and amenity waste sites.

Many local authorities are now adopting both variants on their highways networks in combination, as they can offer long-term solutions to the multitude of stresses that might affect any single carriageway. Their uses in these combined situations can either be made visible to the public or to merge with each other by the subtle use of pigmentation. The ease by which colour can be added to a grouted macadam, mainly black, red, green or buff provides another strong argument for their use by engineers and traffic managers.

What are the benefits?

These materials provide a reinforced impervious surface with major advantages over conventional bituminous materials. These advantages include:

- Fuel/oil and chemical resistance
- High abrasion resistance
- High compressive strength
- Reduced permeability
- Improved durability
- They provide a high strength but flexible heavy duty surface course ideally suited to areas of high loading and turning stresses. Grouted macadams do not rut under channelised traffic.



Cross section of pavement fully grouted.

- They provide a long lasting textured finish which doesn't diminish over time
- Grouted macadams provide a totally impervious surfacing so water cannot penetrate and freeze reducing the formation of potholes
- They regulate the underlying surfacing providing a smooth textured finish and relatively quiet road surfacing
- Suitable for overlay on a wide range of existing surfaces
- These products normally come with an extended guarantee between three to seven years
- The matrix ensures high strength combined with the flexibility to combat underlying ground movement avoiding fatigue cracking, proving highly advantageous for the protection of existing substrates that may have been weakened through past water ingress
- Sealing of the surface course prevents fretting, reduces the speed of binder oxidation (ageing) and reinforces surface strength characteristics.
- Although some products on the market have HAPAS certification, some do not so the client needs to determine to what extent third party certification is required
- To obtain the best results it is necessary to give careful consideration to a wide range of details and to plan and design the work carefully and to use experienced contractors with a good track record
- Site selection is important and early contractor involvement is required to ensure the site and particularly the underlying road layers are adequate to ensure long term durability
- These products must be installed by a well trained and qualified workforce. It is imperative that local authorities ensure their contractors have properly trained and qualified operatives ideally with an NVQ level two and all have appropriate CSCS and CPCS cards to ensure both good workmanship and safety.

Summary

Grouted macadams have been in use throughout the UK for over 40 years and even longer in France. They have a long history of proven use and provide an alternative to conventional asphalt surfacings mostly where the site is particularly challenging and offers up problems which conventional asphalts are unable to deal with. They are proprietary products although some have HAPAS certification thereby giving the client third party assurances on quality and performance. The durability is very much dependent on ensuring the correct variant is selected and installed correctly by an experienced contractor with a good track record in this specialist field. It is not a technology that should be undertaken and installed by just any asphalt surfacing contractor. ●

Some important considerations

- The term grouted macadam covers a multitude of products each with a unique ability to solve a specific problem. Asphaltic grouts provide protection to underlying surfaces and resistance to oxidation, detritus and movement, but they cannot compete on strength with cementitious grouts. It is imperative the client specifies the appropriate grouted macadam in the tender documentation. By specifying the stone size, matrix design and type of grout this will ensure the correct product is supplied
- There is no standard specification as yet for grouted macadams

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