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](image1)

![Spreading the grout](image2)

![Finished job](image3)

![Applying the cementitious grout](image4)
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.

- They provide a long lasting textured
  finish which doesn’t diminish
  over time
- Grouted macadams provide a totally
  impervious surface 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.

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
- 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
operators 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.

For further information visit
www.rsta-uk.org