High Friction Surfacing – a gripping story!

High Friction Surfacing or HFS for short was introduced into the UK in 1967. Back then London was witnessing rapid growth in traffic levels and seeing a sharp increase in wet skid related accidents. So the Greater London Council (GLC) challenged industry (TRRL and Shell) to come up with a new road surfacing aimed at reducing braking distances on approaches to junctions, crossings and the like and reducing wet skid related incidents. Trials followed of a new cold applied HFS system based on bitumen extended epoxy resin binder and calcined bauxite aggregate (Shell grip) resulting in a 50% decrease in skid related accidents within the first year of service. The trials were deemed to be a great success and the HFS market then grew steadily through the 1970’s and 80’s with many companies investing in research and development to bring new HFS products to market. At its height the HFS market was estimated at around 4-5 million square metres however today it is nearer to 1 million square metres. So what happened for the HFS market to decline so dramatically, particularly when the product was developed to improve road safety, protect the public and save lives?

The view given by many local authorities is HFS has become too expensive and doesn’t last very long so represents poor value. Local government cut backs over recent years has put serious pressure on highway maintenance budgets to the extent where HFS has become an easy target to use less and save money. Many authorities are now using high PSV asphalt instead in the belief this will deliver the required level of skid resistance over time in the high stress locations where HFS is normally used.

So five years ago the RSTA challenged the BBA who operate the HAPAS scheme for HFS to investigate and report on the product’s service life. This was to be the most thorough and comprehensive survey of HFS performance ever undertaken across the UK. This was supported by Specialist Group 1 (SG1) who are responsible for overseeing the HFS HAPAS Scheme comprising of the key industry stakeholders including ADEPT and Highways England. The BBA subsequently investigated 272 HFS sites over a 2 year period covering all of the different types of HFS products (cold applied resin based and hot applied products) on sites ranging from 1-14 years old. The results from this extensive surveillance exercise were published by the BBA in December 2015 in a report entitled “A study of the visual condition of BBA HAPAS High Friction Surfacing (HFS) Sites”. The report showed that statistically the average service life of hot applied thermoplastic HFS products was 8 years and for cold applied thermosetting products 12 years. About half of the sites investigated were installed without anyone being present from the BBA.

The BBA findings appear to be at odds with some strongly held views by many local authorities who reckon HFS lasts from 2-5 years. So the first point is if you work for a local authority and believe you are only getting 2-5 years service life out of your HFS you should challenge your perceptions and conduct a detailed audit of HFS performance in your area and also involve the contractor who installed the HFS. You might find that actually on average you are getting much longer life than you think and therefore better value. The BBA report in particular highlighted poor surface preparation as being a key factor influencing HFS service life so make sure this is fully considered by both client and contractor during the planning stage. Also make sure your contractor is following industry best practice by adopting the principles and advice contained within the RSTA ADEPT Code of Practice for High Friction Surfacing available from www.rsta-uk.org/publications/.
The second point to make is don’t just assume you will obtain the skid resistance performance you think you need (SCRIM) from a high PSV asphalt. Whilst current standards (HD36) permit the use of high PSV asphalt (65 and above) on relevant site categories with investigatory levels (IL) typically requiring 0.5 SCRIM or higher, PSV is not an absolute predictor of wet skidding resistance. Work done by TRL over the years has highlighted the limitations of the PSV test in terms of predicting wet skidding resistance measured by SCRIM. More recently research published by Somerset CC and WDM Ltd highlighted the variability in measured SCRIM for road surfacings consisting of 60 PSV asphalts from a number of different asphalt plants in the County. Further evidence was provided late last year when TRL published Project Report PPR789 where they compared the performance of HFS versus high PSV asphalts. The data obtained for current and long term performance monitoring concluded HFS performed better than high PSV asphalt and “from the findings of this work it can be concluded that current high PSV asphalts are not able to consistently achieve skid resistance levels similar to traditional calcined bauxite and may not be a suitable replacement for sites where stress levels are particularly high”. WDM also reported in 2016 that in London a SCRIM survey showed quite clearly that HFS out performed high PSV asphalt over time on sites with Investigatory levels above 0.55. So I hope this article has at least challenged current perceptions regarding the durability of HFS and raised concerns regarding the use of alternative surfacing’s.

The RSTA provide CPD courses on High Friction Surfacing and other surface treatments to provide engineers with technical knowledge and insights into the performance that can be expected on varying sites and importantly how to take measures to maximise performance and get best value for money. Courses are available from [www.rsta-uk.org/calendar](http://www.rsta-uk.org/calendar).