

Client Side

High friction surfacing: Detailing the diligence needed for success

Misuse of high friction surfacing is causing concern for the Welsh Assembly Government and local authorities. South Wales Trunk Road Agency principal engineer Gareth Day describes correct procedures for these anti skid measures.

High friction surfacing (HFS) materials have become widely used and many surfacing companies will provide a rainbow of colours to suit almost any desired application. There are concerns that these materials are not always used correctly, however, leading to maintenance problems for the Welsh Assembly Government and local highway authorities.

Design standards and guidance on application of HFS are contained within the Design Manual for Roads & Bridges Volume 7 – Pavement Design & Maintenance (section five, surfacing and surfacing materials) and HD36/06 – Surfacing Materials for New & Maintenance Construction.

Within HD36/06 a table gives site categories, investigatory level and – based on traffic volume – the polished stone value (PSV) required to suit the surface course system.

Sites where HFS is used include those with gradients greater than 5% over more than 50m and approaches to pedestrian crossings or other high risk situations, such as junctions where frequent or sudden braking occurs. A number of these site categories require a PSV greater than 68 and due to the limited availability of this type of aggregate a HFS system is frequently used in Wales.

There are two main processes employed to produce HFS surfaces. Both – ‘hot’ and ‘cold’ applied – use calcined bauxite as the high PSV aggregate. The choice of system is based on site characteristics, weather and ambient temperature at the time of laying, plus personal preferences and experience often influence the type of system laid.

With the hot system the material comes ready blended in polythene bags. The resin used is thermoplastic, ie, it is plastic and



High friction surfacing can perform well for long periods – if applied correctly

workable when hot, then solidifies on cooling to ambient temperature. Application, after the material has been heated in a thermostatically controlled ‘pot’, is via an open bottomed rectangular ‘shoe’ and finished with a screed. Thickness should be approximately equal to the nominal size of the coarse aggregate.

This system is less durable, but it is not as weather dependent and can be opened to traffic within 15 minutes of the last screed being laid. Due to the method of application, ridges are sometimes formed perpendicular to the direction of travel that can cause driver discomfort, and a thicker layer than required can occur, causing durability issues.

With regard to cold systems, there are a number of proprietary resin based formulations on the market. The resins are usually epoxy or polyurethane based. Once the resin is mixed there is a set time for it to be spread and the surface aggregate applied before an initial set takes place.

The resin should be applied – usually by hand – at the appropriate spread rate, as directed by the manufacturer, with the high PSV aggregate spread (by hand) to slightly exceed the amount required to ensure complete coverage of the resin. Excess stone is swept off after the resin has set and bonded to the aggregate in contact.

Use of cold mix HFS on freshly laid asphalt surfaces can cause problems and it is often necessary to allow the asphalt temperature to cool sufficiently and the bitumen to reduce on the aggregate before applying a HFS, to ensure a good bond can be achieved.

With careful consideration and good workmanship, both types of HFS should last the life of the pavement. If appropriate standards are used, there should be no concern over misuse of the products and minimal maintenance for highway authorities.