HIGH FRICTION SURFACING
SAVING LIVES FOR OVER 40 YEARS

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History of High Friction Surfacing

It all Began back in the 1950’s ……..

The concept was first investigated in the USA using Epoxy Binders.

It wasn’t until 1967 did Greater London Council and the Metropolitan Police recognise the need for a durable skid resistant surface tough enough to withstand the harshest traffic environment.
Material Requirements

High Skid Resistant Surface
High Durability of the Wearing Aggregate
Very High Strength Binder
Flexibility and Durability of Binder
Hard Wearing Calcined Bauxite
When the HAPAS guidelines were written for High Friction Surfacing, they decided it didn’t matter what the systems were made from.

What matters is that High Friction Surfacing provides a satisfactory skid resistance over the course of their life span under the anticipated traffic conditions.
High Friction Materials

- Four Different types of BBA Type 1 binders
- All Binders use Calcined Bauxite 1-3mm Aggregate for Anti Skid Sites.

- Polyurethane
- Rosin Ester
- High Friction Surfacing
- Extend Epoxy
- Methyl Methacrylate
High Friction Materials

Exothermic otherwise known as Cold Applied.

- Polyurethane
- Extended Epoxy
- Methyl Methacrylate

Thermoplastic otherwise known as Hot Applied.

- Rosin Ester
High Friction Surfacing relies upon 1-3mm Calcined Bauxite.

Chinese and Guyanese Bauxite has a minimum PSV of 70

The Angular shape of the aggregate does not polish through trafficking.
Exothermic – Cold Applied
Under the BBA HAPAS scheme materials are tested under the following criteria:

- Scuffing initially and following ageing.
- Wear after 100,000 wheel passes.
- Tensile Adhesion.
- Resistance to Freeze / Thaw.
- Resistance to Diesel.
- Thermal Movement.
- Concrete Substrate Test.
## HFS Classification

<table>
<thead>
<tr>
<th>Site Category</th>
<th>Site Definition</th>
<th>Maximum Traffic Levels (Commercial Heavy Goods Vehicles per lane, per day)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>Type 1</strong></td>
</tr>
<tr>
<td>UK Standard</td>
<td>Australian Roads Category</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>3</td>
<td>Approaches to and across all major junctions (all limbs)</td>
</tr>
<tr>
<td>G1</td>
<td>3</td>
<td>Gradient - from 5% to 10% longer than 50m</td>
</tr>
<tr>
<td>H1</td>
<td>3</td>
<td>Bend - Subject to 40mph or lower speed limit, radius from 100m to 250m</td>
</tr>
<tr>
<td>L</td>
<td>7</td>
<td>Roundabout</td>
</tr>
<tr>
<td>G2</td>
<td>2</td>
<td>Gradient - &gt;10%, longer than 50m</td>
</tr>
<tr>
<td>H2</td>
<td>6</td>
<td>Bend - Not subject to 40mph or lower speed limit, radius &lt;100m</td>
</tr>
<tr>
<td>J/K</td>
<td>1</td>
<td>Approach to hazzard, such as roundabout, traffic signals, pedestrian crossing, railway level crossing</td>
</tr>
</tbody>
</table>

**Suitable areas for use to give an expected service life of 5 to 10 years**
### Accident Statistics

#### ROAD INJURY
- In 1997 13,500 persons were hospitalised due to road vehicle incidents on New Zealand Roads.

#### ROAD DEATHS
- 2008 – 366 FATALITIES.
- 2009 – 390 FORECAST.
Why Should HFS be Used?

Passenger Car with ABS travelling at 90kph. Braking Distances in meters.

Comparison shows Roebinda HFS with a standard Bitumenous Wearing Course.
1997 Study evaluated many measures.
34 HFS sites evaluated.
Average cost of installation = £8,620.00 GBP
Accident reduction = 57%.
First Year Rate of Return of 352%.

Accident remedial measures data from TMS Consultancy, Coventry. 1997 statistics
GLC, London Accident Analysis Unit, Surrey, TMS.

Average reduction across studies of around 30-40%.

Wet skid accidents in the region of 50-60%.

In London at least 25% reduction consistently sustained over 10 year periods.
SURFACE SUITABILITY

- The largest cause of HFS failing is due to the surface not being suitable.
- Surface Dressed Roads
- Surfaces with Structural Issues
- Fatted Up Surfaces
- Slurry Seals
High Friction Surfaces are very efficient in transferring the forces created by the tyres friction, into the substrate below. Any weak substrate will suffer under the increased loading which will eventually lead to the High Friction Surfacing and the Substrate to fail.
SURFACES MUST BE ……

- **Clean** - Free from Oil, Fuel Spillage, Salt Residue, Dirt / Dust, General Detritus and Road Film.
- **Dry** – With all systems, a dry surfaces produces a better adhesion to a greater or lesser degree.
- **Sound** – An Adequate Pavement Design which is at least 28 days old.

- Installers must follow the method statements with particular attention paid to the Spread Rates, Environmental Conditions and they should maintain a Detailed Paper Trail.
To Highlight or Not to Highlight
That is the Question

GUYANESE BAUXITE USED TO OFFER HIGH SKID RESISTANCE WITH OUT DRAWING THE ROAD USER TO ITS INCLUSION

RED COLOURED SURFACING USED HERE TO OFFER HIGH SKID RESISTANCE WHILST ALSO DRAWING THE ROAD USERS ATTENTION TO THE HAZARD
Pigmented Aggregates
Other Considerations

Clear Road Markings

Clear Hazard Signage
Accidents will Still Happen
Conclusions

High Friction Surfacing is about Accident Reduction

The value of High Friction Surfacing must be judged against the financial and social benefit of accident reduction.

High Friction Surfacing used alongside effective visible Road Markings and Signage offers a Total Road Safety Package
HIGH FRICTION SURFACING

A Vital Part of an Integrated Infrastructure for the next 40 years

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