

Technical brochure



High bitumen content emulsion for superior performance

Using conventional hot spray binders when sealing in cool or damp conditions poses several risks to the quality of the seal or reseal. Typically this includes stone loss or stripping; or wheel paths flushing in summer months where cutback binders have been used. Under these conditions Fulton Hogan recommends use of its HBCE, which is a high residual binder emulsion designed for chip sealing over a wide range of conditions.

What is HBCE?

HBCE is High Binder Content Emulsion ($\geq 70\%$ bitumen), which is specially formulated by Fulton Hogan to give superior performance over a wide range of sealing conditions and aggregate types. Being a catatonic type, it performs well in cool and damp conditions and bonds well to most aggregates. The high bitumen content allows application at higher rates required by larger aggregate seals with reduced risk of run-off on steep grades or cross-falls.

HBCE is suitable for the same range of works as conventional bitumen sealing treatments with the added benefit that cutters (kerosene) are not required. Application of HBCE is safer, being sprayed at temperatures well below those for conventional cutback bitumen.

What sets HBCE apart?

HBCE has been specially formulated for sealing with larger aggregates and offers the following specific advantages:

- Suitable for use in cool and/or damp weather conditions
- Reduced risk of stripping especially in cold weather
- Compatible over a wide range of aggregate types (no adhesion agent is required)
- Reduced break and cure time and quicker traffic access than conventional 60% grades
- Reduced risk of run-off at elevated application rates on steep pavement grades
- Does not require addition of cutters (kerosene)
- Is non-hazardous
- Less hazardous to handle, as application temperature of HBCE is between 70-90°C, compared to hot bitumen (generally >165°C) and is non flammable.

Recommended applications

- Sealing or resealing heavily trafficked pavements where a larger stone size seal is required
- Sealing over pavements with significant gradients or cross falls and run-off is likely to be a problem
- Where use of conventional bitumen seals pose a high risk e.g. cold and damp conditions, where flushing or bleeding is a risk, or environmentally sensitive areas
- Ensure correct storage and handling of emulsions is followed (guidelines available on request).

How HBCE works?

In cool weather or damp conditions, hot bitumen cools quickly when sprayed (increasing its viscosity). Consequently its ability to wet the stone surface effectively is impaired, resulting in incomplete bonding which leaves the seal vulnerable to damage by traffic. Using cutters assists this process, but these are sometimes trapped in the seal for an extended period contributing to flushing and bleeding in the warmer months. Fulton Hogan's HBCE is a thixotropic (resists run-off), cationic bituminous emulsion with chemical additives designed to perform well under these conditions as well as to resist run-off at application rates up to 3L/m².

HBCE consists of small bitumen droplets stabilised with chemicals that are dispersed in water allowing the bitumen to uniformly coat the aggregate even under cold conditions. Its strong hydrophilic properties displace the water from the aggregate, creating a strong bond with the stone during the breaking process. HBCE's higher percentage of bitumen (>70%) allows for higher application rates to hold larger aggregate sizes (up to 14mm).

How to apply HBCE?

HBCE application rates are dependent upon the nature of the pavement to be treated. Generally, application rates are as set out in the table below:

Aggregate size	Rate of Spread aggregate	Application rate emulsion (hot)
7mm	140 - 150m ² /m ³	1.2 - 1.6 L/m ²
10mm	115 - 135m ² /m ³	1.6 - 2.0 L/m ²
14mm	90 - 120m ² /m ³	1.8 - 2.4 L/m ²

As with all emulsions, maximum strength in the residual binder is achieved with the complete removal of water. As this is largely through evaporation, the time taken depends on the weather conditions prevailing at the time of sealing and for up to several days afterwards. It is essential that only low speed traffic be allowed on new work for at least 2-3 hours after sealing, especially under cold conditions.

It is strongly recommended that for larger single coat reseals (>7mm) that the seal be 'racked-in' with a small aggregate scatter coat (e.g. 5 or 7mm), to provide protection against stone whip-off by early traffic.

Working tips

- For single coat reseals a stone larger than 10mm is not recommended in highly trafficked areas
- A two coat seal is recommended for high volume, heavier trafficked roads or areas of high stress
- Work should not be carried out unless road temperature is at least 8°C and rising
- Work should not be carried out in wet weather or if rain is imminent (but a damp pavement is acceptable)
- Aggregate should be good, clean, sharp stone; and for best results should be lightly pre-coated, particularly if sealing under cool or damp conditions and the pavement is subject to constant traffic
- The completed seal should be subjected to thorough rolling with a multi-tyred roller and then released to slow moving traffic after sealing.

For expert advice on your seal or reseal design, contact your Fulton Hogan representative.

Note: Fulton Hogan has alternative products that can be considered for use when enhanced binder properties are required. Talk to your Fulton Hogan representative for best results.

Note: HBCE must not be mixed with anionic emulsions such as ARS or ASS types due to chemical incompatibility. Care is also required in returning reheated product to existing storage.