SAMIflex ‘E’ HR Series

A High Binder Content Polymer Modified Emulsion range for Sprayed Sealing Applications

Description
SAMIflex ‘E’ HR Series are Polymer Modified Cationic Bitumen Emulsions for sprayed sealing applications and used as an alternative to hot modified binders or conventional bitumen. Polymer modification can be up to 7%, and the solids content is normally in the range of 75% to 78%. Specific site requirements will determine the degree of polymer modification required.

Features and Benefits
SAMIflex ‘E’ HR Series offers all the advantages of plant blended hot SBS Modified Binders with additional benefits
- No heat degradation during transport or storage of the binder
- Improved aggregate embedment and adhesion
- Can be applied all year round, even in cool, damp conditions
- Lower spray temperatures (85°C - 95°C)
- Doesn’t require adhesion agents or cutter/diluents
- Elimination of fuming

Applications
- New seals over properly prepared surfaces
- Reseals over pavements exhibiting surface cracking
- Pavements with high deflections
- Where waterproofing of the surface is necessary
- As a SAMI membrane interlayer, a SAM surface membrane or a High Stress Seal (HSS)

Product Range
The SAMIflex ‘E’ HR Series consists of:

<table>
<thead>
<tr>
<th>Product</th>
<th>Austroads grade</th>
<th>QLD TMR grade</th>
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<tbody>
<tr>
<td>SAMIflex CRS HR</td>
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<td>(unmodified high residue emulsion)</td>
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<tr>
<td>SAMIflex E30 HR</td>
<td>S10E</td>
<td>S0.25S</td>
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<td>SAMIflex E40 HR</td>
<td>S15E</td>
<td>-</td>
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<td>SAMIflex E50 HR</td>
<td>S20E</td>
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<td>SAMIflex E60 HR</td>
<td>S25E</td>
<td>S4.5S</td>
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<tr>
<td>SAMIflex E35 HR</td>
<td>S35E</td>
<td>S0.3B</td>
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The binder residue of the emulsion can be specified in terms of the National or State specification for the appropriate Modified Sprayed Sealing Grade. Customers should specify the appropriate
Austroads or QLD TMR specification grade for the polymer modified bitumen residue, e.g. SAMIflex E60 HR meeting the Austroads specification for S25E, or QLD TMR S4.5S specification. Where a SAMIflex CRS HR is chosen due to cold or poor weather conditions, it is recommended to use SAMIflex E30HR since the binder offers better protection against possible traffic damage during the early stages of curing and overnight trafficking. The presence of a small amount of polymer greatly assists with aggregate adhesion and retention during the early critical stages of the curing process and aggregate embedment.

**Seal Design**
The following information is provided to assist with seal design and to determine the amount of SAMIflex ‘E’ HR required.
Design the seal as a HSS, SAM or SAMI using accepted design practice and incorporate a PMB Factor (PF) of 1.2 - 1.4 and a High Residue Emulsion factor (EF) of 1.1 - 1.2 into the calculation when determining the Residual Application Rate (R) at 15°C. (Note: Where there are low traffic volumes, add 0.1 litre /m² to the residual design application rate).

When designing as per the Austroads Technical Report AP-T68/06 - “Update of Austroads Sprayed Seal Design Method” or the RMS NSW “Sprayed Sealing Guide”, it is recommend that a PMB Factor (PF) of 1.2 is used for 7mm seals and a PMB factor (PF) of 1.3 - 1.4 for 10mm and 14mm seals.

The “Racked-In” process is recommended when a 10mm or 14mm seal is constructed. The application rates required for 10mm and 14mm seals take longer to cure (especially in cooler weather conditions) and if the new seal is opened to trafficking in the initial or early stages of the SAMIflex ‘E’ HR breaking and curing, the larger aggregate tends to move about under tyres. The use of the smaller sized aggregate reduces aggregate movement and roll-over of the larger stone, and it also assists with breaking and curing, thus reducing possible damage from early trafficking. The larger aggregate must have an initial roll to lay on its ALD prior to the smaller aggregate being applied. (For information on Rolling, see page 3).

**Availability**
SAMIflex ‘E’ HR is available ex plant (Sydney, Brisbane, Perth and Melbourne locations) in minimum 8000 litre bulk quantities. SAMIflex ‘E’ HR is manufactured to order and each batch can be tailor made to suit individual requirements.

**Ordering SAMIflex ‘E’ HR and binder calculations**
SAMIflex ‘E’ HR must be ordered in litres at 90°C.
In order to determine the volume of binder the following binder calculations may be used:

Figures used in these calculations are based on 77% residual binder content emulsion and should be used for all SAMIflex ‘E’ HR calculations.

**To Find:**

- **Total Litres of Residual Binder at 15°C (R_{TOT}):**
  
  Multiply the residual application rate \( R \) (litres/ m² at 15°C, from seal design calculation) by the total area to be sealed (m²).

- **Total Litres of SAMIflex ‘E’ HR at 90°C (V_{90}):**
  
  Multiply the Total Litres of Residual Binder at 15°C (R_{TOT}), by 1.36. This figure is required for ordering purposes.

- **Tonnes of SAMIflex ‘E’ HR:**
  
  Multiply the Total Litres of SAMIflex ‘E’ HR at 90°C (V_{90}), by 0.98. This figure will be used for invoicing.

**Transport and Storage**
The proper handling of SAMIflex ‘E’ HR post manufacture is very important. The following should be used as a guide.

**Tankering**
- Only transport in tankers that have been properly cleaned and flushed to avoid contamination or the possible breaking of the emulsion during transit. The heat from the emulsion at 95°C is not sufficient to free blocked valves or lines.
No heat should be applied to the product until the nominated delivery site has been reached. Ensure sufficient time is allowed for at the destination, to heat the product up to a temperature of 90°- 95°C prior to discharging into the sprayer. Heating and circulation must be kept to a minimum and should be done just prior to the time requested on site.

- **Do not** heat at a rate greater than 10°C per hour, or above 95°C
- During heating, commence slow circulation once the product temperature is above 70°C
- **Do not** circulate, pump or transfer product until at least 70°- 80°C
- When transferring product into the sprayer by suction then ensure the tanker is circulating the product during the transfer. When transferring product by pumping then have the sprayer circulating the product. This will assist with the re-blending of any "skin" that may have formed during transportation.
- During transportation there will be some evaporation of water from the product depending on the amount of ullage in the tank. This will cause a “skin” to form on the surface of the product within the tank, which is normal. After transferring the product there may be some binder residue (skin) left in the bottom of the tank, which can be easily removed by flushing the tank as per normal practice.

**Sprayer**

- Ensure that the sprayer and spray bar have been thoroughly flushed prior to loading the SAMIflex ‘E’ HR and the manifold and valves are free and clear
- Once loaded, commence heating to spraying temperature (85°- 95°C). Circulate slowly during heating
- **Do not** circulate, pump or transfer product unless the product temperature is greater than 70°C
- **Do not** heat at a rate greater than 10°C per hour, or above 95°C
- Where a damp pavement is to be sealed, the spray temperature of the product should be around 95°C to assist with the “breaking” process
- SAMIflex ‘E’ HR is sprayed using standard sized AN18 spray jet (A4 jets)

**Storage**

- SAMIflex ‘E’ HR can be stored for up to 3 weeks provided storage tanks are cleaned prior to use and have adequate heating capability
- Once SAMIflex ‘E’ HR is in storage allow the product to cool to ambient temperature and only re-heat just prior to use
- Slow circulation is necessary when re-heating provided the temperature is above 70°C.
- The tankers must be able to heat the product at a rate not greater than 10°C per hour without localised heating.

**Recommended Field Practices**

**Spraying**

- SAMIflex ‘E’ HR can be applied on steeper gradients and cross falls
- The product can be sprayed over a wide variety of weather conditions.
- SAMIflex ‘E’ HR may be applied in damp conditions, but not when the pavement is wet, rain is imminent or when raining
- At the completion of spraying, the sprayer must be thoroughly flushed to avoid leaving any material which may break and contaminate future loads

**Aggregate**

- The aggregate may be damp, preferably pre-coated and must be free of any dirt or foreign matter
- After spraying, the application of the aggregate is best left until the SAMIflex ‘E’ HR has started to break (turn black) or “skin”. Timing for this to occur is very much dependent on both pavement and ambient air temperature
- If the application rate or gradient/cross fall is such that the product starts to run or move, apply the aggregate as soon as possible then wait for the break/curing process to begin before commencing rolling
Rolling

- The main function of the rollers is to orientate the aggregate and to assist with the breaking and set-up of the SAMIflex ‘E’ HR
- If the “Racked In” aggregate process is not used then pick-up may occur in the early stages of rolling, however this is dependent on application rates, aggregate size, and the amount or freshness of aggregate pre-coat
- For best results, if possible allow the binder to partially break or “skin” prior to spreading the aggregate this will reduce the chance of “pick-up” on the roller’s tyres
- If un-precoated aggregate is used then rubber tyred rollers may experience “pick-up”. To reduce this risk, lightly spray the tyres with water. SAMIflex ‘E’ HR has a very strong affinity to the rubber on rubber tyred rollers and if any contact is made, there may be a build up of SAMIflex ‘E’ HR and aggregate on the tyres. This can cause further pick up of the aggregate from the fresh seal causing “Pock Marks”

Brooming

- Brooming may commence once rolling has been completed and the binder has fully cured
- When it is necessary to sweep before the binder has fully cured, such as late in the day prior to darkness, **light** brooming is recommended however some aggregate may be dislodged

Traffic Control

- It is recommended to keep the speed restriction of 40kph until the emulsion is fully cured and the pavement swept
- Refer to RMS, NSW “Emulsion Guide” for further information

**NOTE:** *Whilst every care is taken in the preparation of this data sheet, no responsibility is accepted for the interpretation of information contained herein, nor is any warranty expressed or implied for the suitability of the material for a particular application.*