

### ***Akzo Nobel Products for Slurry Surfacing***

Slurry surfacing is a system in which the reactivity of the components must be matched. The most reactive aggregates require emulsion systems of lower reactivity. Akzo Nobel offers a full range of products for slurry sealing and microsurfacing, which allow the emulsion producer and slurry contractor to deal with a wide range of aggregates, asphalts and weather conditions.

#### ***For Standard Slurry Sealing***

Redicote E-11	Recommended where hand-working may be required
Redicote E-250	As Redicote E-11 but faster cohesion development
Redicote E-4868	For reactive aggregates

In standard slurry sealing the main objectives are to have a simple flexible system tolerant of changes in aggregate, asphalt and temperature.

#### ***Redicote E-11***

Redicote E-11 is a water-soluble emulsifier which does not need neutralization with acids and which gives excellent emulsion quality, with good storage stability. It also doubles as a slurry break retarder to extend the mix time in hot weather, where its easy dissolution is an advantage. As break retarder it can be added to the finished emulsion or to the mixer. A high flash point version called Redicote E-11HF-1 is available for greater safety in field addition. Cement addition to the slurry also extends the mix time in most cases, which provides extra flexibility in hot weather. The consistency of slurries based on Redicote E-11 makes them ideal for hand-working, while the strongly cationic character of Redicote E-11 provides good adhesion compared to slurries based on SS emulsions.

#### ***Redicote E-250***

In all respects similar to Redicote E-11, except providing faster cohesion development. Redicote E-250 can be used as a co-emulsifier in quickset or microsurfacing systems or as a break retarder in these systems where it shows fewer tendencies to overstabilize than Redicote E-11. Because of its faster-setting character it is less suitable for hand-working the seal.

#### ***Redicote E-4868***

This emulsifier produces super-stable emulsions for use with reactive aggregates or high temperatures. Cement or lime are recommended as fillers.

#### ***For Quick-set Slurries***

Redicote C-471	For unreactive aggregates MB<3
Redicote C-450	For standard aggregates 3<MB<7
Redicote E-250	Co-emulsifier for reactive aggregates MB>7

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The main objective in quickset systems is to have sufficient mix time even at elevated temperatures while still giving good cohesion development in cooler conditions.

### *Redicote C-471*

Designed to give good cohesion development even with aggregates of low reactivity.

### *Redicote C-450*

Standard CQS emulsifier.

### *Redicote E-250*

When used as co-emulsifier, gives sufficient mix time with reactive aggregates or at higher temperatures, but still builds cohesion when used under cooler conditions.

### *For Microsurfacing*

Redicote C-471	For unreactive aggregates
Redicote C-404	For standard aggregates
Redicote C-462	For standard aggregates
Redicote E-9A	Co-emulsifier to extend mix time and improve adhesion/cohesion

The main objective in microsurfacing is to provide a road surface with the highest degree of durability. The emulsifiers used must be compatible with latex types and capable of emulsifying polymer-modified asphalts. Generally the emulsion is tailor-made for the specific aggregates to be used and for the season. Combinations of emulsifiers often offer the best performance and the flexibility to modify the reactivity depending on the time of year or weather conditions. Small amounts of solvent (0.5-2%) can be incorporated in the emulsion for cool weather work down to 5°C (41°F).

### *Redicote C-471*

The product used alone is suitable for the least reactive aggregates. In combination with Redicote E-9A or Redicote E-250, slower-setting emulsions suitable for more reactive aggregates or for summer use can be formulated.

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<b>Typical Recipes:</b>	<b>For low-reactive aggregates</b>	<b>For medium-reactive aggregates</b>
	0.8-1.5% Redicote C-471 HCl to water phase pH 1.0 3.5-4.0% latex (cationic type) 63-65% AC-20 asphalt water to 100%	0.6-1.2% Redicote E-9A 0.2-0.3% Redicote C-471 HCl to water phase pH 1.0 3.5-4.0% latex (cationic type) 63-65% AC-20 asphalt water to 100

### *Redicote C-404*

Standard microsurfacing emulsifier. Provides somewhat longer mix times than Redicote C-471. Can also be used in combination with Redicote E-9A or Redicote E-250.

### *Redicote C-462*

Low cost product for standard systems, used like Redicote C-404.

### **For Phosphoric Acid Systems**

Redicote C-320	For all aggregate types
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Emulsions prepared with phosphoric acid give good cohesion development with even low acid value, poorly reacting asphalts. Redicote C-320 has been specially developed for these systems. The emulsions are also less corrosive than those based on hydrochloric acid.

### **Formulation Tips:**

- Latex is best added *via* the water phase or to the finished emulsion. If added to the water phase we recommend it be added after the emulsifier. Separation of the latex during storage can be minimized by increasing the asphalt content of the emulsion to 63-65%.
- Cohesion development is generally improved by a lower emulsion pH 0.5-1.0; higher pH extends the mix times.
- Generally cement shortens mix times and accelerates cohesion development but some aggregates react in an opposite way. In slurry systems based on Redicote E-11 or Redicote E-250 emulsifiers, cement usually extends the mix time. Lime generally extends mix time.
- Asphalts with high acid values generally give the best cohesion development.
- Cohesion development in cold weather is helped by including 0.5-1.5% light solvent in the emulsion formulation.

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### ***Break Retarders***

Redicote C-480	For slurry seals and microsurfacing based on Redicote C-471, Redicote C-450 and Redicote C-404
Redicote E-1 1 and Redicote E-1 1HF-1	For slurries based on Redicote E-1 1 or for other slurries in extreme hot conditions, including phosphoric acid based slurries.
Redicote E-250	For slurries and microsurfacing, as Redicote E-1 1

While in many cases the emulsifier can also be used as a break retarder in slurry surfacing, Akzo Nobel offers the convenience of easily water-soluble additives, which can be added directly undiluted into the mixer or water line in suitably equipped pavers. High flash point products Redicote E-1 1HF-1 and Redicote C-480 are available for safe use in the field.

If the microsurfacing or slurry system is designed with a short mix time and will need a break retarder in the field, then the retarder should also be included in the laboratory evaluations of compatibility and adhesion.

### ***Technical Assistance***

Akzo Nobel offers technical assistance to its customers in the correct selection of emulsifiers, including a complete mix design service.

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