Akzo Nobel Technical Service Report No. 324 – Interim Report
Date Completed: February 29, 2000
Purpose: Testing of antistrips for HFRS emulsions

Raw Materials:

1. HFRS 150S emulsion (untreated)
2. HFRS 150S emulsion (treated)
3. Granite Aggregate 624
4. Mixed Aggregate 645A
5. Limestone 652
6. Research Aggregate from Texas (siliceous gravel)
7. Redicote E-62C lot Z252
8. Kling® Beta 101AP
9. Redicote® E-11
10. Husky 150/200
11. Husky 120/150 ref 1398 (1999)

Aim of work:
To identify adhesion promoters for HF emulsion used in chipseal applications. Based on earlier screening work, Redicote E-11 and Kling Beta 101AP were selected for evaluation.

Test Emulsion:
An anionic emulsion was prepared with the following composition for the test work:

Husky 150/200 AC	63
Cutter #2 fuel oil	1.3
Redicote E-62C	1.20
NaOH	0.15
Water	to 100

Test Method:
The following method was used.
150g of + ¼" aggregate (unwashed) was very gently mixed with 30g emulsion (excess) then spread in a 4" diameter circle on a 16 mesh screen supported above a tray. After 1 hour cure in a fan oven at 60C it was allowed to cure 10mn, then transferred to a plastic jar, covered with 2 liters distilled water and left 1 hour. Then the lid was placed on the jar and the jar shaken for 5 minutes on a sieve shaker.

The contents were spread out on paper and examined for coating when dry.

For the test results described here, all the additives were added by stirring into the cold emulsion, then leaving overnight at room temperature before testing. All the additives were tested at 0.5% basis emulsion except where stated. No problems were encountered in dispersing the additives and the treated emulsions looked stable.

Coverage (%) of aggregate

Aggregate	granite	Siliceous limestone	limestone	Gravel	
				0.5% dosage	0.25% dosage
Untreated	< 5	5-10	60-65	< 5	< 5
Kling Beta 101AP	65 –70	75 –80	80- 85	70 –80	60 –70
Redicote E-11	85 –90	75 –80	90 -95	95 –100	85- 95

Effect of Additives on Demulsibility:
An important feature of HF emulsions is their demulsibility
The additives had been earlier tested for their demulsibility on another emulsion with the composition:

Husky 120/150	62
Redicote E-62	0.8
NaOH	0.13
Water	to 100

	Demulsibility %			
Dosage % emulsion	No treatment	0.25	0.5	1.0
Kling Beta 101AP	23		28	
Redicote E-11	23	31	45	100*

* signs of emulsion thickening when additive stirred in.

Conclusions:
1. Both Kling Beta 101AP and Redicote E-11 improve the adhesion of HF emulsions to a variety of aggregates. Redicote E-11 is more effective.
2. Redicote E-11 has a tendency to significantly increase the demulsibility of the emulsion.