

TECHNICAL BULLETIN # 57

SAMI Bitumen Technologies

2, 3-5 Gibbon Road
Winston Hills, NSW 2153

PO Box 164,
Winston Hills, NSW 2153

Telephone: +61 2 9624 0101

Facsimile: +61 2 9624 0191

SAMIfalt EME Binder

Description

SAMIfalt EME Binder is an innovative bitumen designed for use in high modulus asphalt mix (Enrobés à Module Elevé - EME) with increased stiffness, fatigue and rut resistance properties over conventional bituminous mixes.

Developed in France by Colas in the 1990's, EME has been extensively used on motorways, airports and urban roads in Europe and elsewhere.

SAMIfalt EME Binder is an unmodified bitumen and is used for high modulus asphalt base course applications imparting very high stiffness which in turn will allow a reduced layer thickness compared to conventional base courses for the same level of traffic.

Features

SAMIfalt EME Binder is manufactured with the aid of a blowing column under controlled conditions in order to obtain unique rheological properties.

Even though it is a hard grade of bitumen, it differentiates itself from a hard roofing grade through a controlled softening point range and a viscosity range.

Typical rheological characteristics of SAMIfalt EME Binder are presented in the Table 1:

Table 1 – SAMIfalt EME Binder rheological characteristics

Property	Test Method	SAMIfalt EME Binder	QTMR* Specification
Penetration, 0.1mm	AS 2341.12	16	15 - 25
Softening Point, °C	AS 2341.18	70.0	56 - 72
Viscosity @ 60°C, Pa.s	AS 2341.2	6080	900 minimum
Loss on heating, %	AGPT/T103	0.01	0.5 maximum
Retained Penetration, %	AS/NZS 2341.10, AS 2341.12	81	55 minimum
Increase in Softening Point after RTFO treatment, °C	AS/NZS 2341.10, AS 2341.18	4.0	8.0 maximum
Viscosity @ 135°C, Pa.s	AS 2341.4	2.05	0.6 minimum
Penetration Index	AS 2341.12, AS 2341.18	0.4	Report

*QTMR – Queensland Transport and Main Roads

Binder Characteristics and Mix Workability

SAMIfalt EME binder has been proven to be homogenous and stable under hot storage conditions.

If handled at the recommended temperatures, it does not fume during the manufacturing, laying and compaction of the asphalt mix.

Despite its inherent stiffness, SAMIfalt EME binder has very good workability and compactability.

The increased binder content of EME mixes compared to conventional base course mixes aids with workability and compactability.

Economic Benefits

The technology of high modulus asphalt base courses (EME) has been in use over 20 years. The main benefit that it brings about is the reduced thickness of the EME base course in the pavement structure compared to

conventional base courses as DG 20. Depending on the site and traffic conditions, the difference in thickness could be up to 30%.

This will translate in a more economical pavement when EME base course layer is being used.

The specification governing the usage of EME base courses are performance based and the mix design criteria is presented in Table 2:

Table 2 – Mix design criteria

Property	Test method	SAMIfalt EME Mix	QTMR Specification
Air voids in specimens compacted by gyratory compaction, %	EN 12697-31	4.8	6 maximum
Water Sensitivity, %	AG:PT/T232	93	80 minimum
Wheel Tracking at 60°C and 30,000 cycles, mm	AG:PT/231	2	6 maximum
Stiffness Modulus, MPa	AG:PT/233	15,500	14,000 minimum
Fatigue Resistance, $\mu\epsilon$	AG:PT/233	190	150 minimum

Storage of SAMIfalt EME Binder

SAMIfalt EME binder has been proven to be homogenous and stable under hot storage conditions.

Recommended storage times are as follows:

Mixing Temperature	175 – 185°C
Holding Time at Mixing Temperature	10 days
Medium-Term Storage Temperature	120 – 140°C
Medium-Term Storage Time	20 days
Paving Temperature	Minimum 165°C

For storage of binders for periods longer than those listed above, please contact SAMI Bitumen Technologies. Longer storage times apply to lower storage temperatures.

Mixing

The mixing temperature and the holding time at mixing temperature refer to the binder prior to its introduction into the mixing process. Adjustments to these temperatures may be required to allow for prevailing conditions such as pavement surface temperature, wind speed, asphalt mix type and haulage distance.

Precautions should be taken to ensure that flow meters or other batching systems are properly calibrated to take into account of the different viscosity/temperature relationship of SAMIfalt EME Binder compared to conventional bitumen.

Laying

The minimum mix temperature in the paver should be 165°C with compaction commencing at this temperature.

Rolling

Use steel rollers with a minimum capacity of 7 tonnes and vibratory capacity (the first pass should be vibratory).

No pneumatic or rubber tyre rollers should be used until the mix cools down sufficiently, so that no “pick up” occurs.

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