

# **COMMENTARY TO AG:PT/T237 - BINDER FILM INDEX**

## **PREFACE**

This Asphalt Test Method was prepared by the Asphalt Research Review Group on behalf of the Austroads Pavement Technology Review Panel. Representatives of Austroads, ARRB Transport Research and the Australian Asphalt Pavement Association have been involved in the development and review of this test method.

## **FOREWORD**

The calculation of Binder Film Index attempts to provide a measure of the aggregate coating by the binder when incorporated into asphalt. The value determined should not be thought of as the mean thickness of the binder film coating each stone.

## **SCOPE**

This test method sets out the calculation procedures for the determination of a Binder Film Index. The test is applicable to all types of asphalt.

## **Further Development**

None.

# BINDER FILM INDEX

## 1 REFERENCED DOCUMENTS

The following documents are referred to in this method:

### AS /NZS

1141.5	Particle density and water absorption of fine aggregate
1141.6.1	Particle density and water absorption of coarse aggregate – Weighing-in-water method
1141.7	Apparent density of a filler
2341.6	Determination of density using a hydrometer
2341.7	Determination of density using a density bottle
2891	Methods for Sampling and Testing of Asphalt
2891.3.1	Bitumen content and aggregate grading - Reflux method
2891.3.2	Bitumen content and aggregate grading - Centrifugal extraction method
2891.3.3	Bitumen content and aggregate grading - Pressure filter method
2891.8	Voids and density relationships for compacted asphalt mixes

## 2 PROCEDURE

- a. Determine the particle size distribution and binder content in accordance with AS 2891.3.1, AS 2891.3.2 or AS2891.3.3.
- b. Determine the particle density of aggregates in accordance with AS 1141.5, AS 1141.6.1 and AS 1141.7 (see Note 1).
- c. Determine the density of the bitumen in accordance with AS 2341.6 or AS2341.7.
- d. Determine the effective binder content in accordance with AS 2891.8.

## 3 CALCULATIONS

Calculate the Binder Film Index (BFI) for an asphalt mix from the following equation:

$$BFI = \frac{Q_{EB}}{100 - Q_{BIT}} \times \frac{B}{2.65 \times A} \times \frac{10^3}{\rho_{BIT}}$$

where

BFI = Binder film index

$Q_{EB}$  = effective binder content (% by mass of asphalt mix)

$Q_{BIT}$  = total binder content (% by mass of asphalt mix)

$\rho_{BIT}$  = density of binder at 25°C ( $t/m^3$ )

B = combined bulk density of the mineral aggregates ( $t/m^3$ )

A = surface area of aggregate blend, which is calculated as follows;

$$A = (2 + 0.02a + 0.04b + 0.08c + 0.14d + 0.30e + 0.60f + 1.60g) \times 0.20482$$

where

a = percent passing 4.75 mm sieve

b = percent passing 2.36 mm sieve

c = percent passing 1.18 mm sieve

d = percent passing 0.60 mm sieve

e = percent passing 0.30 mm sieve

f = percent passing 0.15 mm sieve

g = percent passing 0.075 mm sieve

## 4 REPORTING

Report the following:

- a. Combined bulk density of the mineral aggregate in  $t/m^3$  to the nearest 0.001.
- b. The effective binder content as a percentage by mass to the nearest 0.1.
- c. The Binder Film Index to the nearest 0.1.
- d. A unique sample identification number.
- e. Reference to this test method; AG:PT/P237.

### Notes

The particle density of the aggregate is determined according to clauses AS 1141.5 clause 3.2 and AS 1141.6.1 clause 3.1. These clauses specify determinations based upon dry mass of the sample. Use of apparent or saturated-surface-dry procedures will produce an incorrect binder film index.

## AMENDMENT RECORD

Amendment No.	Clauses amended	Action	Date
1	Commentary Page	New	June 2005
	Footer and header	Format	
	Applied revised test method number	Format	
	Applied new styles	Format	

### Key

Format	Change in format
Substitution	Old clause removed and replaced with new clause
New	Insertion of new clause
Removed	Old clauses removed