

# Characteristic of Flexural Stiffness and Fatigue Performance of Bituminous Mixes



TP477

## 1.0 SCOPE.

This test method shall be the same as Austroads AGPT/T274 January 2016 with the following changes:

## 2.0 REFERENCES

As in Austroads AGPT/T274 January 2016

## 3.0 EQUIPMENT

As in Austroads AGPT/T274 January 2016

## 4.0 SPECIMEN PREPARATION

As in Austroads AGPT/T274 January 2016

## 5.0 TEST PROCEDURES

As in Austroads AGPT/T274 January 2016

## 6.0 STIFFNESS TEST

As in Austroads AGPT/T274 January 2016, but not required for this test method.

As in Austroads AGPT/T233 January 2006 Clause 6(o) Initial Flexural Stiffness & (p).

## 7.0 FATIGUE RESISTANCE TEST

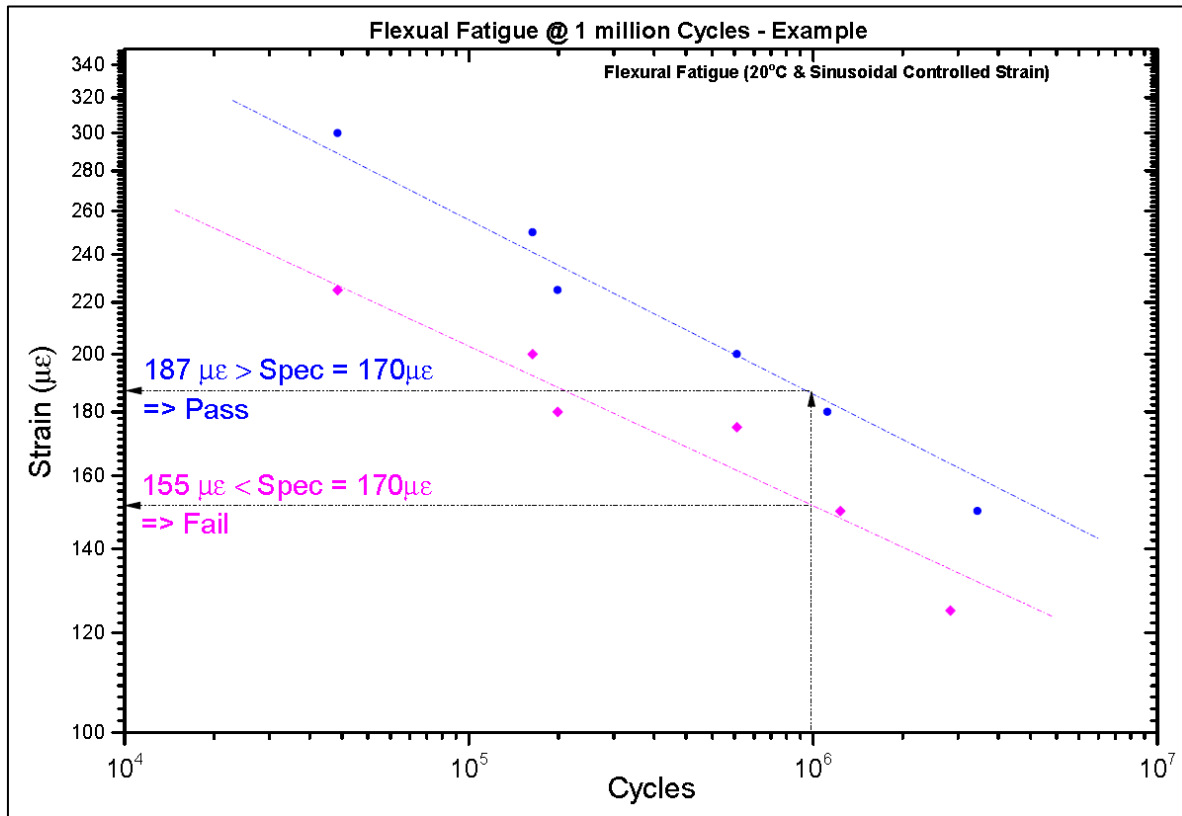
As in Austroads AGPT/T274 January 2016 with the specified test conditions in "Clause 11.5 Test Conditions" altered to the following:

A fatigue line of best fit to  $\log N_f$  and  $\log$  Strain with measurements of not less than 5 individual specimens, each at different strain levels (Figure 1).

Table 1: Standard Reference Test Conditions

Test Parameter	Standard Reference Test Conditions
Test Temperature (°C)	20 ± 0.5
Loading Frequency (Hz)	10 ± 0.1
Mode of Loading	Continuous Sinusoidal (i.e. no rest period between successive loading cycles) in controlled displacement.
Tensile Strain (µε)	The levels for the chosen loading mode shall be chosen such that the fatigue lives are within the range 10 <sup>4</sup> to 2x10 <sup>6</sup> cycles.  Strain rates to be chosen to be approximately centred around the specified cycles and spaced at approximately 25 µε intervals.  The strain conditions shall be selected so that the number of cycles to failure exceeds 10 <sup>6</sup> for at least one specimen.
Initial Stiffness	The flexural stiffness at 50 <sup>th</sup> cycle
Failure Condition	When the flexural stiffness is reduced to 50% of the initial flexural stiffness
Fatigue Life (cycles)	Strain Rate at 1 million cycles (1x10 <sup>6</sup> ) determined from line of best fit (log strain verses log cycles plot)

Figure 1: Example of a fatigue line of best fit to log N<sub>f</sub> and log Strain



### 8.0 Derivation of the Master Curve

As in Austroads AGPT/T274 January 2016, but not required for this test method.