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Technical Data
Effect of MR on Asphalt Fracture Resistance

Importance to Roads

Fracture resistance is widely recognised as a key engineering property of asphalt used for road construction and surfacing.

Higher fracture resistance is an indicator of reduced potential for asphalt cracking, either from the top-down or from the bottom-up, resulting from either environmental or traffic induced cyclic tensile stress.

Methods of Evaluation

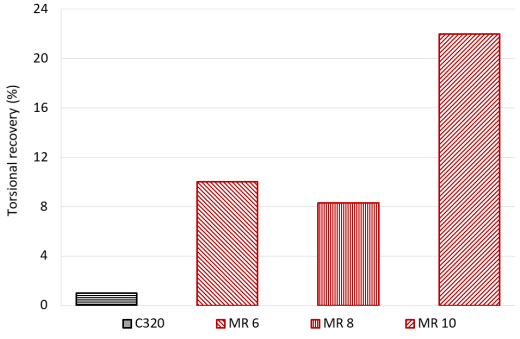
Fracture resistance can be measured directly in the laboratory, using one of a range of monotonic or repeated load tests, usually using either flexural beam or indirect tensile cylinder samples.

The contribution of the bituminous binder to fracture resistance can also be indirectly evaluated in the laboratory by various bitumen properties. Higher torsional recovery, elastic recovery (in the MSCR protocol) and force ductility (at low temperature) are all indicators of bituminous binder contribution to asphalt fracture resistance.

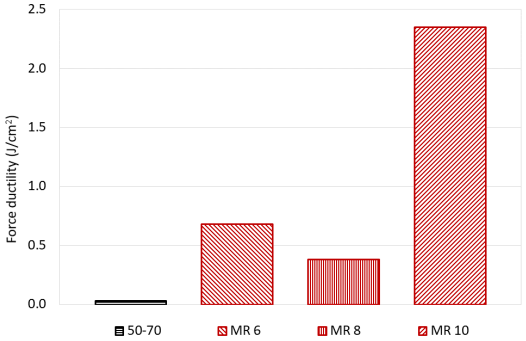
Effect of MacRebur

MacRebur MR 6 and MR 10 significantly improve the fracture resistance of asphalt mixtures compared to unmodified (penetration or viscosity grade) bitumens. MR 8 provided a modest improvement or comparable performance to unmodified bitumen.

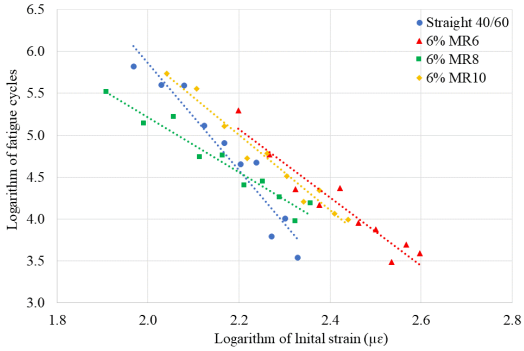
Testing in Australia demonstrated an increase in bituminous binder torsional recovery, compared to unmodified C320, which is similar to 50-70 penetration bitumen.



MR 6, MR 8 and MR 10 increased the force ductility (at 25°C) of 50-70 penetration bitumen.



Asphalt testing of British SMA 10 mixtures demonstrated an increase in fatigue life of indirect tensile cylinders, as a function of initial strain magnitude, for MR 6 and MR 10 modified asphalt. MR 8 provided comparable performance.



Similarly, testing of Australian dense graded asphalt indicated an increase in the flexural beam fatigue life of MR 6 and MR 10 modified mixtures.