



MacRebur Ltd
 Unit 3, Broomhouses Industrial Estate,
 Lockerbie, DG11 2RZ
 Telephone: +44 (0)1576 204 318
 Email: info@macrebur.com

www.macrebur.com

Technical Data

Comparing MacRebur to conventional polymers

The benefit of Macrebur products

Comparative testing in the UK, Australia and the USA has consistently shown that, compared to nominally identical materials without MacRebur, MR6 and MR10:

- Increase the stiffness or modulus of asphalt.
- Improve the crack resistance of asphalt.
- Increase the deformation resistance of asphalt.
- Increase the softening point of bitumen.
- Introduce elasticity of bitumen.

These benefits are comparable to the effects of conventional polymers for bitumen modification.

Conventional polymer modification

Polymer modification of bituminous binder for asphalt production has been routine since the 1990s. The most commonly used polymer is SBS. SBS modified binder produces asphalt with significantly improved flexibility and improved resistance to deformation, despite a reduction in stiffness or modulus. Although less commonly used, EVA is also an established conventional polymer modifier for asphalt production. EVA modified binders produce asphalt with significantly improved resistance to the shear stresses associated with turning and breaking vehicles, as well as much greater stiffness, which can reduce the required pavement thickness.

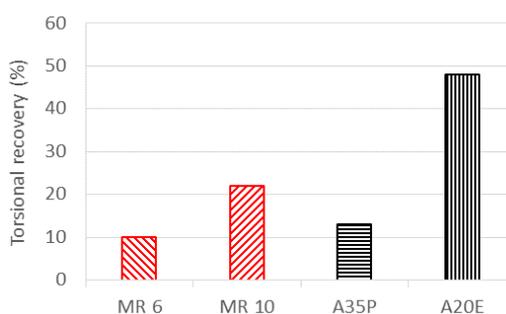
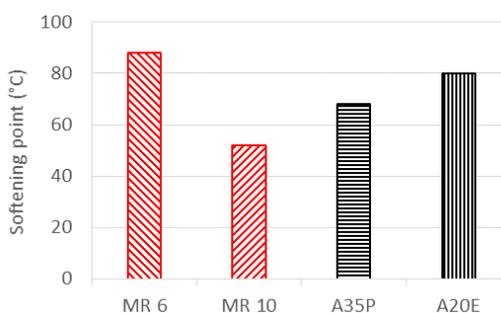
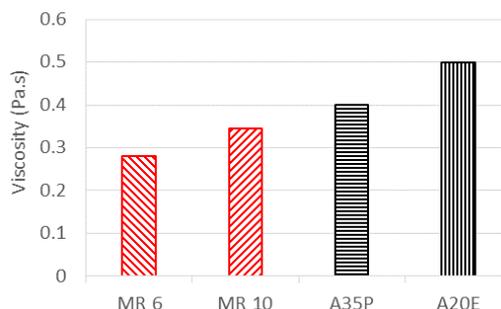
Comparison of MacRebur product effects

MacRebur products MR6 and MR10 have similar effects to those of conventional polymers. This is determined from comparative testing of binders modified with MacRebur products, as well as binder with conventional polymer modifiers, or by comparison to conventional polymer modified bitumen specification limits.

In Australia, common grades of polymer modified binder include:

- A35P. Typically 3-5% plastomeric EVA polymer.
- A20E. Typically 4-6% elastomeric SBS polymer.

The key Australian PMB specification properties are compared to those for bitumen with 6% MR6 and 6% MR10 in the following figures. The MacRebur products produced binders with comparable properties to those of Australia's highly modified PMBs. The similarity of 6% MR6 and A35P is specifically highlighted.



Similarly, MSCR-based Performance Grading of bitumen from the Middle East showed that 4.5% SBS, 4.5% MR6 and 6% MR10 all produced a PG 76-10 binder. This again shows the comparable effect of MacRebur products with those achieved by conventional polymers.

Parameter	Binder modified with			
	4.5% SBS	4.5% MR6	5.0% MR6	6.0% MR10
High Temperature PG rating	76°C	76°C	82°C	76°C
Low Temperature PG rating	-10°C	-10°C	-10°C	-10°C

Ongoing work will compare MacRebur to conventional polymers in typical asphalt mixes.