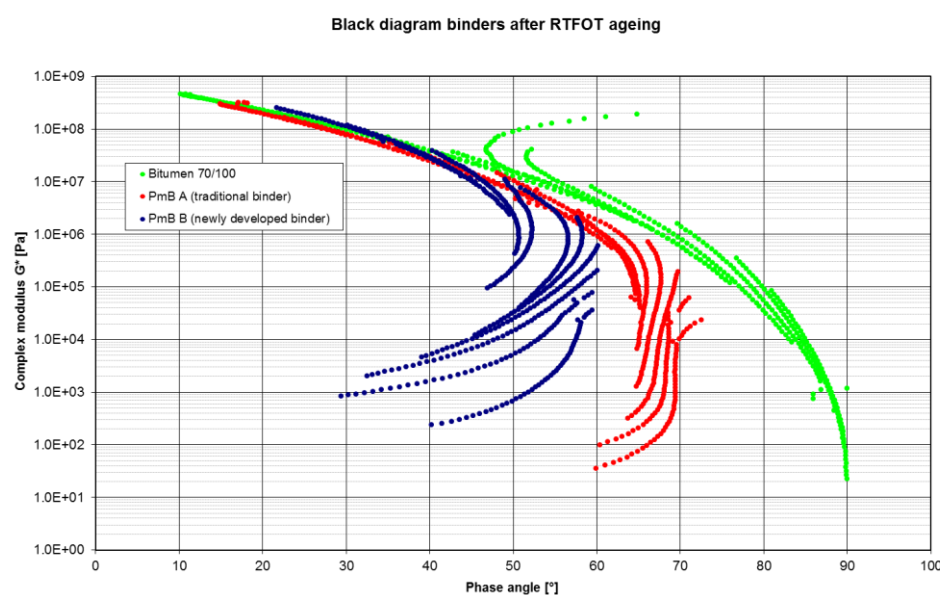


DEVELOPMENT OF A DURABLE NOISE REDUCING THIN SURFACING FOR HEAVY TRAFFIC

Introduction

In densely populated areas, such as in the Netherlands, traffic noise is a major problem. To enlighten this problem, noise reducing thin surfacings were developed. These became popular in urban areas roughly 10 years ago for (provincial) highways. This type of pavement surface consists in most cases of thin (semi-)open asphalt mixtures (about 10 to 20% air voids).

With the use of a newly developed heavily polymer modified bitumen (PmB) a thin surfacing could potentially also be laid down at intersections, tight turns, interchanges and heavy duty roads. To do so, the pavement has to withstand severe shear forces under different environmental conditions during a comparable lifetime as a conventional Dutch SMA-NL5.



Results laboratory development work

The results clearly show an improvement with the use of the newly developed PmB. A thin surfacing with a high durability has to have a high toughness / mass loss ratio; at least equal to a conventional SMA mix. As can be seen in the figure, the TS A (open graded) + PmB mixture is comparable to the SMA 70/100. The TS B (semi-open) + PmB mixture is as expected better and almost comparable to the SMA + PmB mix.

Also, RSAT results indicate, that the resistance against abrasion for both mixtures are similar and the mass loss is as expected very low.

At last, field trials have been made to validate the laboratory results. The sites showed no damage after being in use for 2 winters. It thus looks as if a thin noise reducing surfacing containing a high-quality PmB could be used as an alternative for a conventional SMA surface course at intersections, junctions and heavy duty roads.

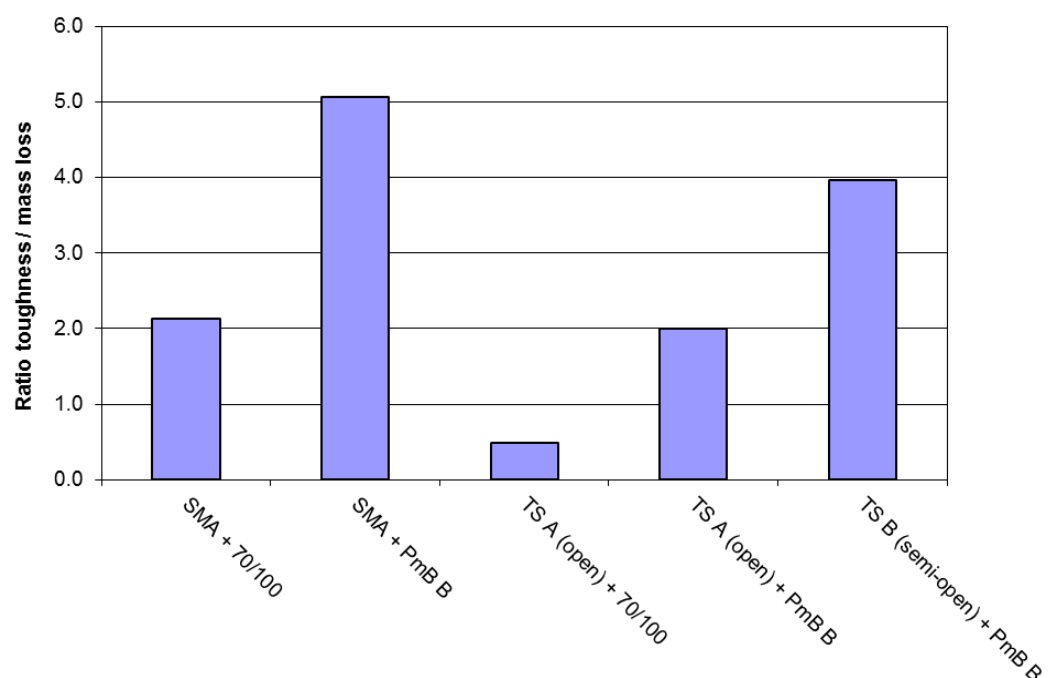
Test program

Compacted Marshall samples were prepared with standard SMA 5 according to the Dutch specifications and 2 types of thin surfacings (TS) in combination with respectively a conventional bitumen 70/100 and the newly developed binder (PmB) type B.

After artificial ageing and simulation of severe long-term environmental conditions (based on AASTHO R30) the performance of the samples was tested by indirect tensile (EN 12697-23) and Cantabro (EN 12697-17) tests at a temperature of 5 °C.

Furthermore, the resistance against ravelling of the best performing thin surfacing with the developed PmB was tested in comparison with a conventional SMA-NL5 using the so-called Rotating Surface Abrasion Test (RSAT).

Asphalt mixture testing



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