

Priming of Pavements

pavement work tips – No 1

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INTRODUCTION

Priming is the application of a suitable primer to a prepared pavement as a preliminary treatment to the application of a sprayed seal or asphalt surfacing.

The function of a prime is to:

- obtain a bond between the pavement and subsequent seal or asphalt
- penetrate the surface of the prepared pavement
- provide temporary waterproofing.

The success of priming relies on:

- preparation and finished condition of base materials
- selection of an appropriate primer
- selection of appropriate application rates
- suitable weather conditions
- application procedures.

Granular pavements prepared to be primed should be allowed to dry out on top and to a depth of 5–10 mm in order to allow the prime to penetrate into the pavement pores and provide a strong bond for the final treatment.

Priming pavements that are too damp will prevent penetration of the primer. They may require excessive time to dry and cure, and residue left on the surface may affect the next treatment. If pavement remains damp, it may be preferable to primerseal.

General guidelines for the selection of priming as an initial treatment and weather conditions for application are provided in Pavement Work Tip No 18, *Sprayed Sealing - Selection of initial treatments*. Further guidelines for the preparation of pavements are provided in Pavement Work Tip No 49, *Preparation of pavements for priming and primersealing*.

The purpose of this particular work tip is to provide guidelines for the selection of priming materials and their application rates.

PRIMING MATERIALS

Materials used for priming include:

- Australian Standard classes of cutback bitumen (AS 2157)
- field prepared mixtures of cutback bitumen
- proprietary grades of cutback bitumen
- proprietary grades of bitumen emulsion.

The choice of primer is mainly influenced by pavement material type and surface porosity, as well as weather conditions, the desired life of the treatment and timing and type of final treatment.

A guide to Australian Standard classes of cutback bitumen primer is shown in Table 1, including the approximate proportion of cutter oil used in the field preparation of equivalent materials.

A guide to the typical viscosity range of proprietary grades of cutback bitumen and preparation of non-standard grades of field-produced cutback bitumen is shown in Table 2.

Proprietary grades of bitumen emulsion should be selected and used in accordance with manufacturer's recommendations. Note that standard grades of bitumen emulsion are not suited for use as primers due to poor pavement penetration and their tendency to remain on the surface as a tacky material.

PRIMER APPLICATION RATE

Typical application rates are shown in Table 3. These rates refer to the total volume of the mixture (i.e. including cutter oils and/or water content) expressed at 15°C.

Factors influencing application rates include those issues already referred to as influencing selection of primer type and grade.

Key Summary

This issue of 'pavement work tips' provides some practical guidelines for the selection of priming materials and priming application rates



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Table 1 Australian Standard classes of cutback bitumen primer

Class	Grade	Viscosity at 60°C (Pa.s)	Equivalent percent cutter oil (vol. at 15°C)	Spraying temperature (°C)
AMC00	Very light	0.008–0.016	56	10–30
AMC0	Light	0.025–0.05	44	35–55
AMC1	Medium to Heavy	0.06–0.12	34	60–80
AMC2	Very heavy	0.22–0.44	27	75–100

Table 2 Typical viscosity ranges for non standard and proprietary grades of primer

Grade	Viscosity Range Pa.s @ 60°C	Approximate percent of cutter oil (vol. at 15°C)
Very light	0.010–0.020	54
Light	0.025–0.050	44
Medium	0.050–0.080	38
Heavy	0.080–0.200	32
Very Heavy	0.200–0.400	28

Table 3 Typical cutback bitumen primer application rates (total volume of primer)¹

Pavement	Primer	
	Grade	Rate of Application L/m ²
Tightly bonded	Light	0.6–1.1
Medium porosity	Medium	0.8–1.1
Porous	Heavy to Very heavy	0.9–1.3
Limestone	Heavy to Very heavy	2 applications 1 st @ 0.7–0.9 2 nd @ 0.5–0.7
Sandstone	Heavy to Very heavy	2 applications 1 st @ 0.7–0.9 2 nd @ 0.5–0.7
Hill gravels, granitic sands	Light	0.8–1.1
Stabilised	Very light to Light	0.5–0.8
Concrete	Very light	0.2–0.4

1. Application rates are generally applicable to dry pavements. For damp pavements, primer application rates may need to be reduced by up to 20%.

CURING AND LIFE EXPECTANCY

A cutback bitumen prime should be allowed to cure for at least 3 days prior to asphaltting or sealing. Covering sooner can adversely affect the performance of the asphalt or sprayed seal.

Bitumen emulsion primers will set up and cure more quickly. In warm weather conditions, they may be sealed or covered with asphalt, as early as 24 hours after application.

The life that can be expected of a properly selected and applied prime, without further treatment other than normal maintenance, will be several weeks. Life will be longer on roads with very low traffic. Surfaces left for long periods may, however, require re-priming before sealing. The use of a primerseal or a prime and

light aggregate seal may be preferred for protection of pavements that are to be left for longer periods without trafficking.

REFERENCES

- Pavement Work Tip No 18, Sprayed sealing – Selection of initial treatments.
- Pavement Work Tip No 49, Preparation of pavements for priming and primersealing.

For more information on any of the construction practices discussed in "pavement work tips", please contact either your local AUSTROADS representative or AAPA: tel (03) 9853 3595; fax (03) 9853 3484; e-mail: info@aapa.asn.au.

A complete list of "pavement work tips" issues is available on AAPA's website: www.aapa.asn.au

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