

**Technical Specification**

**Transport and Main Roads Specifications  
MRTS19 Cutter Oils**

**March 2020**

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## 1 Introduction

This Technical Specification applies to the material requirements for cutter oil to be used in road construction, rehabilitation and maintenance.

This Technical Specification shall be read in conjunction with MRTS01 *Introduction to Technical Specifications*, MRTS50 *Specific Quality System Requirements* and other Technical Specifications as appropriate.

This Technical Specification forms part of the Transport and Main Roads Specifications Manual.

## 2 Definition of terms

The terms used in this Technical Specification shall be as defined in Clause 2 of MRTS01 *Introduction to Technical Specifications*. Additional terms used in this Technical Specification shall be as defined in Table 2.

**Table 2 – Definition of terms**

Term	Definition
Manufacturer	An organisation which has the necessary plant and equipment to manufacture cutter oils to this Standard. For supply only contracts, the manufacturer shall be the Contractor.
Cutter Oil	A light petroleum distillate with either a low or high flash point, added to a bituminous binder to temporarily reduce its viscosity. Cutter oils are typically lost from sprayed seals over a period of months.

## 3 Referenced documents

Table 3 lists documents referenced in this Technical Specification.

**Table 3 – Referenced documents**

Reference	Title
AS 3568	<i>Oils for Reducing the Viscosity of Residual Bitumen for Pavements</i>
MRTS17	<i>Bitumen</i>
MRTS20	<i>Cutback Bitumen</i>

## 4 Standard test methods

The standard test methods listed in Table 4 shall be used in this Technical Specification.

Further reference to test numbers and test descriptions is provided in Clause 4 of MRTS01 *Introduction to Technical Specifications*.

**Table 4 – Standard test methods**

Property to be Tested	Test Method No.
Density	Q374 or ASTM D1298 or ASTM D4052
Distillation	ASTM D86
Flash Point (Abel) – for cutter oil	AS/NZS 2106.1 or ASTM D3828
Flash Point (Pensky – Martens Closed Cup)	AS 2106.2 or ASTM D93 or ASTM D3828
Viscosity	ASTM D445

## 5 Quality system requirements

Materials supplied to this Technical Specification shall be sampled and tested in accordance with Clause 9.

The conformance requirements which apply to this Technical Specification are summarised in Clause 6.

## 6 Material

### 6.1 General

When mixed with bitumen, cutter oil shall be capable of producing homogeneous cutback bitumen which complies with the requirements of MRTS20 *Cutback Bitumen*. Cutter oil shall be completely miscible with bitumen and no precipitation shall occur.

### 6.2 Properties

Cutter oil shall comply with the property requirements of Table 6.2.

**Table 6.2 – Properties of cutter oil**

Property	Test Method	Unit	Cutter Oil <sup>(1)</sup>			
			Low Flash Point		High Flash Point	
			Minimum	Maximum	Minimum	Maximum
Appearance	–	–	Clean, bright and visually free from solid matter and undissolved water at ambient temperature			
Miscibility with bitumen	–	–	Cutter oils shall be completely miscible with bitumen and no precipitation shall occur			
Density at 15°C	Q374 or ASTM D1298 or ASTM D4052	kg/L or t/m <sup>3</sup>	Report		Report	
Distillation range:	ASTM D86	°C	140	–	140	–
Initial boiling point						
Final boiling point						

Property	Test Method	Unit	Cutter Oil <sup>(1)</sup>			
			Low Flash Point		High Flash Point	
			Minimum	Maximum	Minimum	Maximum
Flash Point	AS/NZS 2106.1 or AS 2106.2 or ASTM D93 or ASTM D3828 <sup>(2)</sup>	°C	38	–	61.5	–
Viscosity at 40°C	ASTM D445	mPa.s	0.5	2.0	0.5	2.0
		or mm <sup>2</sup> /s	0.7	2.5	0.7	2.5

Notes:

<sup>(1)</sup> Oils that have been certified to meet the requirements of Jet A1 aviation fuel may also be used as cutter oil.

<sup>(2)</sup> Flash point tests shall be conducted using the method of test which is applicable for the flash point test result obtained for the sample being tested.

## 7 Manufacture

The cutter oil manufacturer shall:

- a) operate a quality system certified to AS/NZS ISO 9001
- b) operate to an inspection and test plan acceptable to Transport and Main Roads for manufacturing and supplying bitumen cutter oil which demonstrates compliance with this Technical Specification. The inspection and test plan shall include testing of cutter oil (especially materials stored at depots), analysis of results (including run charts) and a requirement for a copy of the results to be forwarded promptly to Transport and Main Roads, and
- c) ensure material supplied from depots can be traced to the production batch and associated test report.

## 8 Delivery of cutter oil to the site

### 8.1 General

The delivery of cutter oil to the Site shall be made in sound and clean bulk tanks, palletised containers or drums which are suitably sealed to prevent contamination by water or any other substances.

### 8.2 Delivery dockets

Delivery of cutter oil to the Site shall be accompanied by a delivery docket giving at least the following information:

- name of the manufacturer
- location and date of manufacture
- product type
- production batch number, and

- certification that production has been sampled and tested as stated in Clause 9 and the properties comply with Clause 6.

Delivery dockets shall be made available for inspection by the Administrator and shall be included in the quality records.

## 9 Compliance sampling and testing

### 9.1 General

Sufficient sampling and testing shall be carried out to ensure that the cutter oil complies with the property requirements of Clause 6. Sampling of cutter oils shall be performed so that the sample is representative of the material present in the container in which it is held.

Samples of cutter oil for compliance testing shall be taken from production plants or depots in accordance with sampling procedures defined in AS 3568, Clause 5 (Sampling).

### 9.2 Sampling and testing by the manufacturer

The minimum frequency for sampling and testing from production plant or depots to be performed by the Manufacturer shall be as stated in Table 9.2.

**Table 9.2 – Bitumen cutter oil testing schedule**

Properties to be Tested	Frequency of Testing		
	Production Plant	All Depots	
	Each Batch	Every 5 <sup>th</sup> Transfer	6 Monthly
Density at 15°C (kg/L or t/m <sup>3</sup> )	✓	✓	✓
Distillation Range (°C)	✓		✓
Flash Point (°C)	✓	✓	✓
Viscosity at 40°C (mPa.s)			✓

## 10 Nonconformance

A major nonconformance means a departure from specified requirements for flash point or miscibility with bitumen. All other nonconformances shall be classified as minor.

All cutter oil which is represented by samples from which a major nonconformance has been detected shall be rejected.

Cutter oil for which a minor nonconformance has been detected shall not be delivered to the Site unless it has been established that such nonconformance shall not materially affect the performance of the product. All relevant documentation used in this process shall be made available to the Administrator and shall be included in the quality records.

