
Process for Approval





Acknowledgement

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Parameters to Consider for Approval

Pass/Fail Parameters

- Wear
- Skid Resistance
- Colour
- Product fails if any of the above do not achieve a pass

Performance Parameters

- Wet and Dry Retroreflectivity (R_L)
- Wet and Dry Luminance under Diffuse Illumination (Q_d)
- These parameters determine if the product is given a high or basic performance rating – or a fail.

Changes to the Current System

Introduction of

- 3 categories
- 2 performance levels
- Performance on chipseal and/or asphalt





Changes

Approval Level

There are 3 levels of approval

Category 1 (New)

New, or markings that are expected to be remarked within 6 to 12 months

Category 2 (current M7)

Marking that are expected to last 12 to 18 months

Category 3 (current M20)

Long life markings



Changes

High and Basic Performance

Basic Performance

This is similar to the performance we have previously been achieving

High Performance

Markings that meet this are likely to be suitable for the requirements for the high performance markings stipulated in the NOC documents



Changes

Surfaces

M7 now has a separate approval list for Chipseal and Asphaltic Concrete

Allows different marking systems for AC and chipseal

Performance Standards

White materials

Performance Category	Dry R_L mcd/m ² /lux	Wet R_L mcd/m ² /lux	Dry Q_d mcd/m ² /lux	Wet Q_d mcd/m ² /lux
High Performance	150	80	120	120
Basic Performance	100	35	80	80

Yellow materials

Performance Category	Dry R_L mcd/m ² /lux	Wet R_L mcd/m ² /lux	Dry Q_d mcd/m ² /lux	Wet Q_d mcd/m ² /lux
High Performance	120	60	80	80
Basic Performance	75	25	60	60

Approval Process

Determination of Category

For Category 1 approval, the two lines laid directly on the road were evaluated at approximately 500,000 vehicle passes.

For Category 2 approval, the two lines laid over existing roadmarkings were evaluated at approximately 1,500,000 vehicle passes.

For Category 3 tentative approval, the two lines laid over existing roadmarkings were evaluated at approximately 2,500,000 vehicle passes.

Final approval for category 3 to be done after 5,000,000 vehicle passes

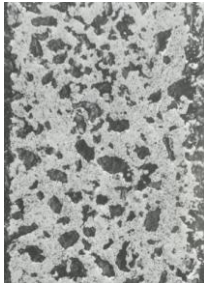
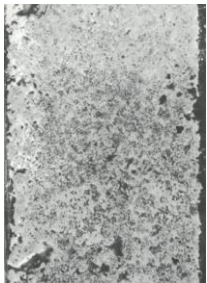


Approval Process

A two stage process

Stage 1: Evaluating the pass/fail criteria

Requires a pass for each of wear, skid resistance and colour. This can be from either of the two lines. This is done for each category.



Approval Process

Examples of the Pass Fail Criteria:

Material	Line	Pass Colour	Pass Skid Resistance	Pass Wear	Pass
A	1	Yes	Yes	Yes	Yes
	2	Yes	Yes	Yes	
B	1	Yes	Yes	No	Yes
	2	No	No	Yes	
C	1	No	Yes	Yes	No
	2	No	Yes	Yes	

This is the case for marking placed on the road and on existing markings



Approval Process

Stage 2: Evaluate the performance parameters

This stage evaluates the two lines independently for categories 1, 2 and 3

Each line is evaluated for the four performance parameters retroreflectivity and lumination under diffuse lighting in wet and dry condition and given a *High*, *Basic* or *Fail* grade.



Approval Process

Stage 2: Grading the lines

A line which fails dry retroreflectivity or two other performance parameters fails.

A line with three or four parameters including retro graded *High* is rated high performance.

All other lines are graded as Basic Performance.

Approval Process

Stage 2: Grading the materials

A material is given its performance rating by the combination of line ratings as seen in the table below:

Line 1 Rating	Line 2 Rating	Material Rating
High	High	High
High	Basic	High*
Basic	Basic	Basic
High	Fail	Evaluate all data
Basic	Fail	Evaluate all data
Fail	Fail	Fail

Approval Process

Stage 2: Example

Material	Line	R _L (dry)	R _L (wet)	Q _d (Dry)	Q _d (wet)	Line Grading	Final Assessment
A	1	High	Basic	High	High	High	High
	2	Basic	Basic	High	High	Basic	
B	1	Fail	Basic	High	Basic	Fail	Manually Evaluate
	2	High	High	High	High	High	
C	1	Basic	Basic	Fail	Fail	Fail	Manually Evaluate
	2	Basic	Basic	Basic	Basic	Basic	
D	1	High	Basic	Basic	Basic	Basic	Basic
	2	Basic	Basic	High	High	Basic	
E	1	Fail	Basic	Basic	Basic	Fail	Fail
	2	Basic	Basic	Fail	Fail	Fail	



Manual Evaluation

For a manual evaluation all 4 lines are taken into account – the 2 lines laid on existing marking and the 2 lines laid directly on the road surface.

At this stage the material could be graded as high, basic or fail dependant on the performance of all four lines

A material that narrowly fails but has good performance at adjacent inspections may receive a pass grade.



The New M7 Document

Specification Layout

This version of M7 combines M7 and M20 into a single specification

It is now four separate documents

- The M7 Specification – The requirements to be on the approval list
 - The M7 Appendices – Detailed procedures to demonstrate compliance
 - The M7 Notes – Guidance notes, aimed at network managers
 - The M7 Approval List – Products which have demonstrated compliance
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Development of a Fingerprint Test

Why do we need a fingerprinting test?

- A very large resource has been expended on assessing the performance of roadmarking materials.
- It is important to ensure that the material that was tested in the trials is the same material that is going on the road.



M7 Clause

In M/7 we have a clause which deal with changes to formulations:

- Suppliers are to provide a sample of the tested material to NZTA for fingerprinting analysis. All changes to the formulation post approval are to be reported to the National Pavements Manager. Non reporting may result in a material being removed from the Approval List.
- Should the manufacturer change the formulation and the cumulative change to a materials formulation be considered large, proof of compliance may be required from the manufacturer.



Fingerprinting Test - Example

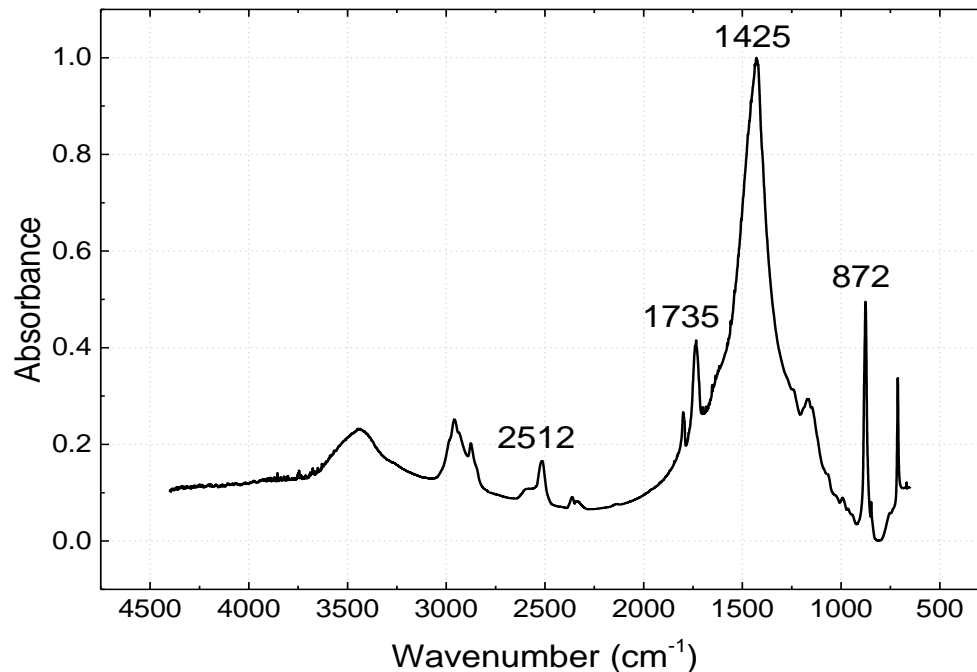
Potential fingerprinting tests could involve:

- Infrared spectroscopy,
- Thermogravimetric analysis
- Elemental analysis by x-ray
- Fluorescence spectroscopy

Fingerprinting Test - Example

Example infrared spectrum of a road marking material:

- Overall shape is unique for different formulations
- Peak intensities can be used to quantify relative concentrations of different material components



National Roadmarking Steering Group

Proposal to develop a group to;

- Assess current needs and new developments in the application of roadmarkings
- Assess current needs and new developments in roadmarking materials
- Assess and review if necessary the safety aspects of manufacturing road marking materials
- Assess and review if necessary the safety aspects of applying road marking materials
- Review training needs.
- Review of research and provision of guidance on research areas/proposals

Thank You

