

NZTA M25:2021 SPECIFICATION FOR RETROREFLECTIVE SHEETING

Retroreflective sheeting for road signs and vehicle
registration plates

Incorporating:

M25 Retroreflective sheeting – Notes

December 2021

VERSION 2.0



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DOCUMENT INFORMATION

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Document Status	Replaces: M25:2019 Retroreflective sheeting-Specification - plus related separate documents; M25:2019 Retroreflective sheeting-Notes
Document Availability	These documents are located in electronic form on the Waka Kotahi NZ Transport Agency's website at www.nzta.govt.nz
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RECORD OF AMENDMENTS

Amendment Number	Subject	Effective Date	Updated by
1	NZTA M25:2019 Retroreflective sheeting - Specification	April 2019	Ron Minnema
2	Revision to: NZTA M25:2021 Specification for retroreflective sheeting (incorporating M25 Notes) Withdrawing: NZTA M25:2019 Retroreflective sheeting-Notes	October 2021	Julian Chisnall

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1. FOREWORD

The objective of NZTA M25 *Specification for retroreflective sheeting* is to provide guidance for retroreflective sheeting manufacturers wishing to market their retroreflective sheeting in New Zealand and to ensure that all manufacture of traffic signs complies with the requirements of the Land Transport Rule, Traffic Control Devices 2004. The Specification and this “Amendment 1” was prepared by Programs and Standards, Waka Kotahi NZ Transport Agency, Wellington¹ subsequent to the release of the AS 1906.1:2017 Standard – *Retroreflective materials and devices for road traffic control purposes: Part 1 Retroreflective sheeting*².

The objective of M25 Amendment 1:2021 is primarily to combine M25 *Specification* and M25 *Notes* into one document in order to ensure that all relative specification information is available without requiring access to or missing key information detailed in secondary documents. The combining of *Specification* and *Notes* sees the introduction of a new document; M25 *Listing of approved vehicle registration plate sheeting*.

In conjunction with the above, M25 *Test Summary Certificate templates*, has replaced M25:2019 *Certificate SET* to provide editable *Test Summary Certificate* templates. Appendix A herein has been revised to underscore the need to accurately describe sheeting being tested and the importance of using the correct template relative to the sheeting format being tested. These formats are:

- (a) Original factory sheeting
- (b) Colour processed screen printing ink
- (c) Colour processed colour overlay film ECF
- (d) Colour processed digital print with clear overlay

No phase in period is provided because no significant specifications have been added. It should be noted that AS 1906.1:2017 Amendment 1:2020 has been published recognising slightly reduced photometric values for Colour processed sheetings. Additionally, although *Approved Material* status has now been limited to a period of ten (10) years (sub clause 6.1.2 and Section 7 herein) this will not require any immediate action by sheeting manufacturers.

The main changes listed in the now superseded NZTA M25:2019 *Retroreflective sheeting – Specification* and NZTA M25:2019 *Retroreflective sheeting – Notes* remains the same and includes:

- Introduction of the new class numbering system (refer Clause 2 Table 1 herein or Standards Clause 1.5)
- Introduction of the new photometric Class 1100 (refer Clause 2 Table 1 herein or Standards Clause 2.2.2 Table 2.1)
- Revised photometrics for Class 900 (previously Class 1W – refer Clause 2 Table 1 or Standards Clause 2.2.2 Table 2.2)
- Deletion of Class 2A with no photometric equivalent introduced
- Addition of new luminance factor values (Standards Clause 2.2.2 Table 2.8 and 2.9)
- Removal of indoor accelerated weathering test
- Revised photometric values for process coloured sheeting (Standards Clause 2.7.2(a))
- Additional requirement for sheeting identity marks (Standards Clause 2.11)

¹ Hereafter referred to as Waka Kotahi

² Hereafter referred to as AS1906.1 or the Standard. This also includes Amendment 1:2020.

- Outlining testing of new sheeting necessary to gain *Interim Approval* and *Approved Material* status for submitted sheeting and sheeting formats.
- Confirming the process that is required by manufacturers seeking to gain approval for retroreflective sheeting for vehicle number plates
- Identifying the last day manufacturers may submit test results via *Test Summary Certificates* prior to scheduled updates being posted to the New Zealand Gazette

Reference in M25:2019 to the process for regaining approval for sheeting previously approved and gazetted based on the now superseded AS/NZS 1906.1:2007 Standard has been deleted since this program has been completed.

2. RELATED DOCUMENTS

Readers should comply with the most current publication of the document being referenced.

- [Land Transport Rule: Traffic Control Devices 2004](#)
- [New Zealand Gazette - Land Transport Rule: Traffic Control Devices 2004 – Reflective material approved for use on traffic signs](#)
- [Waka Kotahi Traffic Control Devices Manual Part 1: General requirements for traffic signs](#)
- [AS/NZS 1906.1:2017 Retroreflective materials and devices for road traffic control purposes - Part 1: Retroreflective sheeting](#)
- [AS 1906.1:2017 Amd 1:2020 Retroreflective materials and devices for road traffic control purposes, Part 1: Retroreflective sheeting](#)
- [NZTA M25:2021 Test summary certificate templates \(editable\)](#)
- [NZTA M25:2021 Listing of approved vehicle registration plate sheeting³](#)
- [NZTA P24:2020 Specification for the design, manufacture, installation and maintenance of traffic signs](#)
- [Waka Kotahi Traffic Control Devices Manual Part 5: Traffic control devices for general use – between intersections](#)
- [Waka Kotahi Traffic Control Devices Manual Part 4: Traffic control devices for general use – at intersections \(under consultation\)](#)

3. SCOPE

This Specification covers the requirements that manufacturers and suppliers must comply with before retroreflective sheeting can be approved for use in New Zealand for:

- Permanent and temporary retroreflective sheetings for use on traffic signs
- Retroreflective sheeting for use in the manufacture of vehicle registration plates

This Specification must be read in conjunction with AS 1906.1:2017 - Part 1 using the same descriptions, definitions, and classifications of retroreflective sheeting.

³ The listing of approved retroreflective sheeting for the manufacture of traffic signs is found in the New Zealand Gazette

4. DEFINITIONS

(a) **Original factory sheeting:**

The basic sheeting received from the manufacturer or supplier prior to any sign manufacturer addition

(b) **Processed colour:**

The addition of colour to a basic original factory sheeting using one of three typical methods:

- Screen printing ink– sheeting colour processed using screen print inks
- Colour overlay film – use of a transparent coloured pressure sensitive film typically referred to as electronic cuttable film (ECF)
- Digital printing ink – sheeting colour processed using the digital printing process that is typically overlaid with a clear overlay film.

(c) **CIL:**

Coefficient of luminous intensity - Quotient of the luminous intensity reflected in the direction considered, divided by the illuminance at the retroreflector for given angles of entrance, observation and rotation.

(d) **cd/lx:**

Candela per lux – a measurement of retroreflectivity 'R'

(e) **May:**

Term used to indicate something that is optional and may be considered for use

(f) **Must:**

Term used to indicate something that is mandatory or required by law

(g) **Retroreflective:**

Describes a material or device that reflects light back to the light source being distinct from simple mirror reflection that beams light away from a light source in an equal but opposite direction to its direction of input

(h) **RCA:**

Road Controlling Authority. Roading authority responsible for the maintenance and management of the road in any specific region

(i) **Shall:**

Term used to indicate something that is mandatory or required by law

(j) **Should:**

Term used to indicate a recommendation based on industry best practice

(k) **Specification:**

In this set of documents, the word "Specification" shall be interpreted as referring to NZTA M25: *Specification for retroreflective sheeting*

(l) **Standard:**

In this specification the word "Standard" shall be interpreted as a Waka Kotahi approved national or international document that has been published by a recognised Standards organisation being used to provide a means of compliance with this specification. Standards must be identified by their Standards organisation and number; e.g. AS/NZS 1906.1.

(m) **Supplier:**

The entity, sometimes the actual manufacturer that supplies the retroreflective sheeting to the sign manufacturer

(n) **Symbol 'R':**

Coefficient of retroreflection expressed in cd/lx: the quotient of the coefficient of luminous intensity (CIL) of a plane retroreflecting surface and its area

(o) **Test Summary Certificate:**

The *Test Summary Certificate* is an abbreviated test report or cover page, available at M25 *Test Summary Certificate templates*, used and issued by the testing laboratory, summarising the formal detailed results for each test completed.

5. GENERAL

Use of retroreflective sheeting for the manufacture of traffic signs is specified in the Traffic Control Devices Rule, reference sub clause (a) of Clause 4.4(7); *If this rule requires a traffic sign or part of a traffic sign to be reflectorised, it must be: (a) reflectorised by the use of reflective material that is approved by the Agency by notice in the Gazette.*

Clause 4.4(7)(a) is relevant to this specification in that only the sheeting types that are detailed in the published New Zealand Gazette (Section 2 sub clause (b) herein) can be used in the manufacture of road traffic signs. These sheeting types will be expected to have been tested and to have met the current standard prior to publication of the Gazette

To meet this requirement Waka Kotahi requires new retroreflective sheeting to be tested and registered compliant with AS 1906.1:2017 plus Amendment 1:2020 and any other amendments that may be published⁴ in order to be used in the manufacture of:

- Permanent and temporary traffic signs on New Zealand roads
- Retroreflective for vehicle registration (number) plates

To gain approval for retroreflective sheeting, manufacturers and suppliers shall comply with the approval process outlined in Clause 6.1 (Traffic Sign Sheeting) and Clause 6.2 (Vehicle Registration Plate Sheeting) and bear the costs of testing and reporting.

Compliance must be for a single photometric performance Class (Table 1), identified by brand, sheeting series number or letter and colour number. Any post factory sheeting, process coloured sheeting formats that required in the production of traffic signs must also be identified using identification numbers or letters in the test report, (Table 2).

Compliance to AS 1906.1:2017 must be confirmed using a *Test Summary Certificate* (Appendix A herein and NZTA M25 *Test Summary Certificate templates* signed by an independent testing laboratory with IANZ or NATA accreditation and approved by Waka Kotahi or be an independent testing laboratory approved by Waka Kotahi⁵.

Each *Test Summary Certificate* must include only one specific sheeting series or one specific process colour format and be signed and issued by the approved testing laboratory as an original PDF document.

The testing laboratory must be very specific when identifying the factory sheeting or colour processed sheeting including process, colour identification and any overlay sheeting required when completing the *Test Summary Certificate*. Any colour processed sheeting will have colour added to white base sheeting that must be identified. This white base sheeting must be confirmed compliant on its own Factory Sheeting *Test Summary Certificate* before the colour processed sheeting can be confirmed compliant.

⁴ Retesting is only required for such amended items that increase a photometric value or revise a performance value such as chromaticity or luminance or physical property. If a photometric value is decreased retesting is not required.

⁵ Hereafter referred to as approved testing laboratory

The outcome of all tests completed must register either a *Pass* or *Uncertain*⁶ or *Not tested* result (or not applicable N/A) for each individual test.

Table 1: AS 1906.1:2017 Photometric Performance Classes (2007 CLASS NOTED WHERE APPLICABLE)				
Photometric Class		2017 Standard Photometric Table	Typical Technology	Generic description
Current	Superseded			
Class 100	Class 2*	2.5	Enclosed lens glass bead and Prismatic	Engineer Grade
Class 300	Class 1	2.4	Encapsulated lens glass bead	High Intensity Glass Bead
Class 400	Class 1	2.3	Micro-Prismatic	High Intensity Prismatic
Class 900	Class 1W**	2.2	Micro-Prismatic	Standard Wide Observation Angle Prismatic
Class 1100	N/A	2.1	Micro-Prismatic	Premium Wide Observation Angle Prismatic
Class NP090	Class NP	3.1	Enclosed lens glass bead & emerging Prismatic	Flat Plate Sheeting
Class NP090 (EMB)	NP(EMB)	3.1	Enclosed lens glass bead & emerging Prismatic	Embossed Plate Sheeting
Class with Suffix "T"	Suffix WZ	Relative as above	Encapsulated lens glass bead and Prismatic	Temporary Sheeting

NOTE: (*) Class 2A sheeting specified in AS/NZS 1906.1:2007 has no comparative class in AS/NZS 1906.1:2017.
(**) Class 900 photometric values differ from previous Class 1W photometrics in AS/NZS 1906.1:2007.

The *Test Summary Certificate* may include multiple colours within a sheeting series or process colour format provided all colours included have been subjected to the same tests and have the same *Pass* or *Uncertain* or *Not Tested* result.

TABLE 2: Required Identifications when Testing Retroreflective Sheeting (Format components requiring identification)*					
Sheeting Format	AS 1906.1 Sheeting Class Number	Sheeting Series ID number or letter	Process Colour Series ID Number or Letter	Colour ID number or letter	Clear Overlay Series ID** (If required)
Original Factory Sheeting <i>Permanent or Temporary</i>	✓	✓	✓	N/A	N/A
Process Screen Print Ink <i>Permanent or Temporary</i>	✓	✓	✓	✓	N/A
Colour Overlay Film <i>Permanent or Temporary</i>	✓	✓	✓	✓	N/A
Digital Printing Process <i>Permanent or Temporary</i>	✓	✓	✓	✓	✓

* Manufacturer designated series number or identification letters
** Signs may use digital printing without clear overlay if the testing has been so completed. Compliance shall only be awarded when printing is completed using a sheeting manufacturers recommended digital printer.

⁶ NOTE: Appendix K, AS/NZS 1906.1:2017, *Application of Uncertainty of Measurement* explains the protocol by which a testing laboratory is able to declare a "pass" result or issue a *fail* result subsequent to completing each specific test. It also explains the "uncertain" result, a situation where a result may be within the accuracy of the laboratory equipment and operating procedure. In such instances the Transport Agency recognises that such a result is close to compliance and because of this the Transport Agency will typically accept an *uncertain* outcome as a pass.

The detailed laboratory test reports shall not be attached to the *Test Summary Certificate*, but shall be provided to Waka Kotahi if required. Waka Kotahi will not accept detailed laboratory test reports on their own where Waka Kotahi staff may be required to adjudge actual compliance.

6. APPROVAL PROCESS

6.1 Traffic sign sheeting

As described in Section 5 herein, the Traffic Control Devices Rule specifies that, only sheeting types that are published in the Gazette can be used in the manufacture of road traffic signs.

The Gazette is normally reviewed and republished on a three-year cycle but it can be amended at any point within the three-year cycle by publishing an amendment Gazette. This allows sheeting types to be added or removed at any time within the three-year life of the original Gazette. (Refer Section 6.1.2 herein for update timing)

Waka Kotahi has two levels of approval for retroreflective sheeting for use in the manufacture of traffic signs:

- **Interim Approval** (New Zealand Gazette - Schedule 2)
- **Approved Material** (New Zealand Gazette - Schedule 1)

Interim Approval and *Approved Material* for retroreflective sheeting for traffic signs becomes effective only after notification appears in the *New Zealand Gazette* "*Reflectorised Material Approved for Use on Traffic Signs*". [Land Transport Rule: Traffic Control Devices 2004—Reflective Material Approved for Use on Traffic Signs - 2020-au2789 - New Zealand Gazette](#)

6.1.1 Interim Approval

Retroreflective sheeting for use in the manufacture of permanent and temporary traffic signs must complete a two stage approval process; *Interim Approval* and *Approval Material*.

Interim Approval is awarded by Waka Kotahi to a manufacturer or supplier of retroreflective sheeting after submitting proof that the sheeting complies with AS 1906.1:2017 inclusive of Amdt 1:2020. This must be submitted using the *Test Summary Certificate* officially signed by the testing laboratory confirming sheeting compliance prior to outdoor durability testing commencing, together with an A4 size sample of the sheeting.

Within three calendar months of submitting this *Test Summary Certificate* the manufacturer or supplier must confirm a date to Waka Kotahi that sheeting samples have been sent to and established at the Allunga Outdoor Weathering Exposure Laboratory in Townsville Australia.

The *Interim Approval* is confirmed by Waka Kotahi only *after* notice has been published in the *New Zealand Gazette*, with the approval remaining valid until the *Interim Approval* expiry date. This time equates to the time the outdoor durability testing process requires for completion.

Interim Approval permits the manufacturer or supplier to market sheeting for use in the manufacture of traffic signs up to a maximum of four decimal point seven square metres (4.7m²). In the event that the sheeting fails the outdoor durability testing the *Interim Approval* will be withdrawn and the sheeting may no longer be used for traffic sign manufacture. Waka Kotahi may require nominated signs to be removed and replaced at the sign manufacturers cost.

6.1.2 Approved Material

Having been awarded *Interim Approval* outdoor weathering and durability testing must be commenced in order to be awarded *Approved Material* status.

At the successful completion of the durability testing period a *Test Summary Certificate*, issued by the approved testing laboratory supervising the outdoor weathering and durability testing programme, must be submitted to Waka Kotahi as an original PDF document.

The sheeting must remain in place for the exposure period specified in AS 1906.1:2017. Different sheeting classes must remain in the outdoor weathering test programme until a minimum exposure, in mega joules per square metre (MJ/m²) has been reached, (Table 3).

Retroreflective sheeting for traffic signs qualifies as *Approved Material* for use on all traffic signs once the outdoor weathering test results confirm compliance to AS 1906.1:2017.

Table 3: Typical Duration for Outdoor Weathering Testing		
Sheeting Class	Radiant Energy Exposure	Typical duration
Class 100 Permanent Sheeting	15,000 MJ/m ²	2 Years
Class 1100, 900, 400, 300 Permanent Sign sheeting	22,500 MJ/m ²	3 Years
Class 1100T, 900T, 400T, 300T Temporary sign sheeting	3,750 MJ/m ²	6 Months
Class NP090 & NP090(EMB) Vehicle Registration Plate Sheeting	15,000 MJ/m ²	2 Years

Confirmation of *Interim Approval* and *Approved Material* status for retroreflective sheeting for use in the manufacture of permanent and temporary traffic signs will be confirmed only after being notified in the New Zealand Gazette “*Reflectorised Material Approved for Use on Traffic Signs*”.

Updates to the New Zealand Gazette are actioned in April and September of each year. To enable updates to be actioned *Test Summary Certificates* must be received by Waka Kotahi no later than:

- The last day of business in February to enable publication in April
- The last day of business in August to enable publication in October

Final *Approved Material* status does not take effect until after it has been notified by publication in the New Zealand Gazette. At this point the sheeting may be actively marketed in New Zealand for traffic sign manufacture.

Approved Material status is initially for a period of ten (10) years unless quality and durability issues become a cause for concern and require Waka Kotahi to question the manufacturer or rescind the *Approved Material* status. Late in the ninth (9th) year the manufacturer or supplier must initiate a meeting with Waka Kotahi to re-establish the *Approved Material* status. (Refer Section 7 herein).

6.2 Registration Plate Sheeting

Retroreflective sheeting for use in the manufacture of permanent vehicle registration (number) plates is not awarded an *Interim Approval* level.

Manufacturers or suppliers of this sheeting are required to confirm new sheeting compliance in conjunction with outdoor weathering and durability test compliance, from the Allunga Outdoor Exposure Laboratory in Townsville Australia, at which time Waka Kotahi will confirm *Approved Material* status.

Compliance to AS 1906.1:2017 in both instances must be confirmed using a *Test Summary Certificate* (NZTA M25 *Test Summary Certificate templates*) signed by an approved testing laboratory.

The outcome of all tests completed must register either a *Pass* or *Uncertain* or *Not Tested* result for each individual test. Each *Test Summary Certificate* must include only one specific sheeting series or one

specific process colour format and be issued and signed by the approved testing laboratory as a PDF document.

Approved Material status for vehicle number plate sheeting is only confirmed after being listed in NZTA M25 *Listing of approved registration plate sheeting*.

Manufacturers should allow two months from the date the *Test Summary Certificate* is received by Waka Kotahi for the list in M25 *Listing approved registration plate sheeting* to be updated.

Approved Material status for permanent registration plate sheeting is also initially for a period of ten (10) years unless quality and durability issues have been reported by the Contracts and Supply Officer, Contract Management and Support, Registration Plates, Waka Kotahi. Late in the ninth (9th) year the manufacturer or supplier must initiate a meeting with Waka Kotahi to re-establish the *Approved Material* status. (Refer Section 7 herein)

7 CONTINUANCE OF APPROVED MATERIAL

Prior to the expiry of the ten (10) year *Approved Material* period the sheeting manufacturer or supplier must organise a meeting with Waka Kotahi. This re-compliance meeting does not suggest that any retesting must be instigated unless a revision to or an amendment to Part 1 of the AS 1906 Standard has occurred or in-service experience suggests this should be considered.

If a revision to Part 1 of the AS 1906 Standard or an amendment has occurred, re-testing will only be required if a performance specification has been changed outside of current parameters (for example luminance factor or chromaticity being re-specified) or if a retroreflective performance has been increased.

Typically a good in-service record together with written assurance, provided by the sheeting manufacturer, that no significant manufacturing changes have been made will confirm continuance of the *Approved Material* status. Waka Kotahi reserves the right to request re-confirmation testing if issues and in-service experience so suggest.

These assurances together with a satisfactory review of signs in service, including retroreflective performance, daytime colour and overall sign durability supported by a minimum of three (3) RCA Road Safety Engineers should enable Waka Kotahi to re-confirm *Approved Material*.

Manufacturing changes include but are not limited to:

- Introduction of a new manufacturing process
- Introduction of new materials into the manufacturing process
- The sourcing of new raw materials
- Changing the country of manufacture
- Changes to any components used in colour processing

Providing no changes have been made the retroreflective sheeting should continue to be approved by Waka Kotahi for a period to be confirmed up to a maximum of ten (10) additional years.

If Waka Kotahi considers the sheeting performance to be satisfactory and it remains within Standards specifications then the approval will be renewed for the additional period. However, if Waka Kotahi has concerns regarding in-service performance the sheeting may be required to be re-tested for compliance with this specification before *Approved Material* status can be considered again.

8 RE-COMPLIANCE (TO 1906.1:2017)

The previous edition (M25:2019 *Retroreflective sheeting – Notes*) included a clause that set out specifications that Waka Kotahi granted to then current retroreflective sheeting manufacturers and suppliers with either *Interim Approval* or *Approved Material* status based on compliance with the now superseded AS/NZS 1906.1:2007 Standard.

Having completed the retesting program to AS 1906.1:2017 the clause headed Re-Compliance in NZTA M25:2019 *Retroreflective sheeting – Notes* has been withdrawn and therefore does not appear in this revision.

9 SIGN INSTALLATION

NZTA P24 Specification for permanent traffic signs includes the specification for the design, manufacture, installation and maintenance of permanent traffic signs.

This document is the result of the merging of the previous P24 *Performance based specification for traffic signs*, P24 *Notes to the specification* and the Road Safety Manufacturers Association (RSMA) “RSMA Compliance standard for traffic signs” 2008

It is important that specifiers, Road Safety Engineers, Road Controlling Authority Engineers and readers of NZTA M25 *Specification for retroreflective sheeting* are familiar with NZTA P24 in order to be certain that the selection of retroreflective performance will not be detrimentally affected because signs are poorly manufactured, installed or maintained.

In P24 the specifier will become familiar with the reasons for selecting the most appropriate retroreflective performance for traffic signs under their control and understand the features that suggest a specific retroreflective performance is frequently essential to ensure that a sign can be read by the approaching driver in plenty of time for action to be taken relative to the driver’s intentions.

P24 also includes the appropriate angles that signs must be installed at relative to the approach line of a vehicle for optimum results and even includes small seemingly unimportant factors such as not placing a sign immediately behind a tree or other obstruction.

The investment of selecting the optimum retroreflective performance for a sign can also be quickly lost if critical installation factors are not ensured and if critical surveys and maintenance routines are not specified and actioned.

Many modern prismatic technology retroreflectivity sheetings are robust enough to be absolutely suitable for purpose for up to and frequently more than 20 years fully justifying a slight increase in sheeting cost for a better more appropriate performance, but this must be ensured by correct installation and maintenance practices.

NZTA P24 includes such items as well as some very technical items such as the recognition of the effects of windage on traffic signs and detailing of sign structure foundations.

APPENDIX A

TEST SUMMARY CERTIFICATE INTRODUCTION AND COMPLETION

Waka Kotahi requires retroreflective sheeting test results to be submitted to Waka Kotahi using the appropriate *Test Summary Certificate* as outlined herein and in NZTA M25 *Test Summary Certificate templates*.

Waka Kotahi recognises that testing laboratories provide their clients with a full and detailed test report for all completed tests. The detailed test report includes potentially confidential data and some highly complex results that can be difficult for a non-technical person to understand and adjudicate.

For this reason the testing laboratory is required to complete the appropriate *Test Summary Certificate* (M25 *Test Summary Certificate templates*) using information from their clients detailed test report. After being signed by the testing laboratory, the *Test Summary Certificate* is issued as an original PDF Format to the client sheeting manufacturer or supplier.

The sheeting manufacturer or supplier must then submit an original of this *Test Summary Certificate* in PDF format to Waka Kotahi. Waka Kotahi does not require the detailed test report unless this report is required for specific purposes at which time Waka Kotahi reserves the right to request the report.

Although the sheeting manufacturer or supplier may commission several different testing programmes, potentially over a period of time, each with a different report number, Waka Kotahi prefers to receive just one *Test Summary Certificate* that includes all required test results for the stated sheeting.

A1 Design

A *Test Summary Certificate* is designed for original *Factory Sheeting* and for each *colour processed sheeting* format for traffic signs and for vehicle number plates (Table 2). A complete editable set of *Test Summary Certificate templates* are available to download from the Waka Kotahi website as NZTA M25 *Test Summary Certificate templates*.

The *Test Summary Certificate* does not include actual detailed laboratory test results. Subsequent to performing each individual test, the test laboratory is required to:

- Select the appropriate *Test Summary Certificate* template for the sheeting format being tested (Clause 4(b) Definitions herein)
- Confirm the result for each test undertaken
- Register a *Pass* or *Uncertain* or *Not Tested* (or *N/A not applicable*) result in the *Test Summary Certificate*

The *Test Summary Certificate* must be signed and dated by the testing laboratory technician who completed the testing process and approved by an authorised laboratory manager.

Waka Kotahi reserves the right to request the detailed laboratory test report(s) should circumstances require.

A2 General

The *Test Summary Certificate* templates provided in an editable format in M25 *Test Summary Certificate templates* are for use by *Test Laboratories* to record the *Pass* or *Uncertain* or *Not Tested* results for all tests commissioned and completed.

The digitally editable *Test Summary Certificates* may be downloaded by the sheeting manufacturer or supplier and given to their approved testing laboratory use or, alternatively, they can be downloaded directly by the testing laboratory.

The *Test Summary Certificates* may be populated electronically or printed as a blank template and completed by hand.

In either circumstance the final signed *Test Summary Certificate* must be issued in PDF format without changes or updates.

A3 Certificate Completion

While *M25 Test Summary Certificate templates* may be downloaded by either the manufacturer or test laboratory it is recommended that the retroreflective sheeting manufacturer electronically completes the manufacturer section of these forms issuing them in editable format by email to the testing organisation when confirming a test agreement.

A3.1 Manufacturers Section

It is extremely important that the manufacturer or testing laboratory precisely identifies what sheeting is being tested. Failure to do so may result in the rejection of the certificate. This must include selecting the correct template relative to the sheeting format

- Original factory sheeting (Figure 1(a))
- Screen printing ink (Figure 1(b))
- Colour overlay film ECF (Figure 1(b))
- Digital printing ink (UV Ink) with clear overlay (Figure 1(b))

The sheeting series must be identified clearly identifying any colours and colour codes being tested. The sheeting Class must be identified, adding the generic name for the Class and the photometric table that performance will be tested against. (Section 5 Table 2)

Figure 1(a)		Completion of Manufacturers section – Original Factory Sheeting	
Sheeting Manufacturer:	Anonymous Retroreflective Sheeting Co Ltd		
<i>Including Street Address and City</i>	2106 Anywhere Street, Sometown City, Neverland		
Sheeting Tested:	Anonlite Series 2020: 2020 White; 2021 Yellow; 2025 Blue;		
<i>Brand; Sheeting Series; Colours + #(s)</i>	2026 Dark Green; 2027 NZ Green; 2029 Brown		
Retroreflective Class Tested to	Class 400 High Intensity Prismatic Table 2.3		
<i>Class Number; Class Name; Standard Table No</i>			

If the sheeting being tested is a *colour processed format* (AS 1906.1:2017 Clause 2.7) the manufacturer or testing laboratory must identify the white base sheeting including the series number or similar identification (Figure 1(b)). The base white sheeting named must already be confirmed compliant by *Test Summary Certificate*.

The colouring system series identification number must be noted plus a colour ID for each colour that is being tested. If the system is a digital printing system the clear overlay series number must be included and if this clear overlay has a secondary feature, such as “dew resistance” or “graffiti resistance”, this must be noted.

If the testing laboratory is responsible for completing the manufacturer’s section, the sheeting identification must be complete and the correct template, relative to the sheeting format, must be used.

Figure 1(b)	Completion of Manufacturers section – Colour processed sheeting
Screen Ink	Anonlite Series 2020 White - with 850 Series Screen Printing Ink including colour numbers eg 852 Red; 855 Blue; 859 Brown
Colour Overlay ECF	Anonlite Series 2020 White - with 1000 Series Colour Overlay EFC Film including colour numberseg 1001 Yellow; 1002 Red; 1005 Blue; 1006 Dark Green; 1007 NZ Green; 1009 Brown
Digital w/Clear overlay*	Anonlite Series 2020 White - with 2000 Series Ink and 1000 Clear Overlay: including colour numbers eg 2001 Yellow; 2002 Red; 2005 Blue; 2006 Dark Green; 2007 NZ Green; 2009 Brown
	* Clear overlay must state Graffiti Resistant or Dew Resistant if applicable

A3.2 Test Laboratory Section

The testing Laboratory is responsible for providing the *Test Summary Certificate* number(s) (top right of each template) and must include the date of the test commencement.

Figure 2	Testing laboratory section	
Testing Laboratory:	Quality Materials Testing Ltd	Supporting Lab Report Number(s):
Address:	1312 Miscellaneous St, Bordertown, Neverland	A20-20067; A20-20068; C20-2069

The Test Laboratory section includes the record of all supporting test reports that have been used to complete the *Test Summary Certificate* (Figure 2: Supporting Lab Report Number(s))

The Test Laboratory may include multiple colours on a *Test Summary Certificate* but only if they have all attained precisely the same results for all tests. If for example yellow, dark green and blue are all the same but brown has differing results, brown must be recorded on a separate *Test Summary Certificate*, on its own, and filed separately.

A3.3 Recording of Test Results

The test laboratory will conduct each test developing a complete fully detailed test report for the client manufacturer. In conjunction with this the laboratory is asked to record the outcome of each test on the *Test Summary Certificate*, recording either a *Pass*, *Uncertain*, *Not tested*, *Not applicable* (N/A) or *Fail* result if necessary.

Figure 3(a)	Example Line Numbering on a Test Summary Certificate		
Line	Clause	Description	Pass-Uncertain-Not Tested-N/A
1	2.1	<i>Photometric Performance R_A</i>	
2	2.2.2(a)(i)	<i>Chromaticity - Daylight colour</i>	
3	2.2.2(a)(ii)	<i>Chromaticity - Retroreflective Colour</i>	
4	2.2.2(b)	<i>Luminance Factor - Standard colour</i>	
5	2.2.2(b)	<i>Luminance Factor - Fluorescent colour</i>	

Not tested must be entered to show that a specific test was not requested to show that the result was not accidentally omitted. Not applicable is used when, for example, the test is for standard sheeting colours

only hence N/A will be entered into line 5. If the colours that are being tested include a fluorescent colour it will be assumed that an entry for line 4 will refer to standard colours and any entry in Line 5 will be for the fluorescent colours.

Line 1	Line 2	Line 3	Line 4	Line 5
Photometric Performance R_A	Chromaticity Daylight Colour	Chromaticity Retroreflective Colour	Luminance Factor Standard Colour	Luminance Factor Fluoro Colour
Clause 2.1 or Clause 2.7.2(a)(i) or (ii)	Clause 2.2.2(a)(i) or Clause 2.7.2(a)	Clause 2.2.2(b) or Clause 2.7.2(a)	Clause 2.2.2(b) or Clause 2.7.2(a)	Clause 2.2.2(b)
Pass	Pass	Pass	N/A	Pass

The correct template must be used because the “Line Number” on each *Test Summary Certificate* as shown in Figure 3(a) also appears on the Record of Testing spreadsheet completed at Waka Kotahi NZ Transport Agency as shown in Figure 3(b).

Upon completion of all tests requested the test technician must sign off at the foot of the *Test Summary Certificate* and a Laboratory Manager must approve the testing process and outcome. Two copies of this completed *Test Summary Certificate* must be given to the sheeting manufacturer or supplier client one of which will then be presented to Waka Kotahi to support the submission for either *Interim Approval* or *Approved Material* status.

As previously noted Waka Kotahi will update the New Zealand gazette upon receipt of a *Test Summary Certificates* as below:

- (a) Received on the last day of business in February to enable publication in April
- (b) Received on the last day of business in August to enable publication in October