

# TRANSPORT FOR NSW (TfNSW)

## QA SPECIFICATION 3357

### THERMOPLASTIC ROAD MARKING MATERIAL

#### NOTICE

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#### REVISION REGISTER

Edition Number	Clause Number	Description of Revision	Authorised By	Date
		Previously issued as Specification RTA 3257	GM, CMS	15.11.91
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Ed 3 (withdrawn)	1 2 3 4.1 4.3 4.3, 4.4, 4.5 4.1, 4.8 4.5 Annexures Annexure 3357/M	Scope widened to include preformed thermoplastic for School Zone "40" markings Clause rewritten ISO 9002 changed to ISO 9001 Aligned with AS 4049.2. Note regarding grit Omitted. Covered by revised 4.1 Renumbered. Provision for black thermoplastic included. Requirements brought into line with AS 4049.2. Made same as AS 4049.2 Renumbered. Details transferred from clause 2. Editorial changes. References changed.	GM, RNIC	18.08.03
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<b>Edition Number</b>	<b>Clause Number</b>	<b>Description of Revision</b>	<b>Authorised By</b>	<b>Date</b>
Ed 3/Rev 1 (cont'd)	Global  2.4 Annex M	Text revised to direct imperative style. "shall" replaced by "must". Reformatting and minor editing to clarify intent. Clauses rearranged and renumbered. Definitions of "you" and "your" added. Referenced documents updated.		
Ed 3/Rev 2	4.6  5	Colour change requirement after heat stability test deleted.  Reference to a particular test deck on General Holmes Drive deleted.	GM, IC	02.12.10
Ed 3/Rev 3	Global	References to "Roads and Maritime Services" or "RMS" changed to "Transport for NSW" or "TfNSW" respectively.	DCS	22.06.20



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QA SPECIFICATION 3357

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VERSION FOR: DATE:
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## FOREWORD

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### REVISIONS TO PREVIOUS VERSION

This document has been revised from Specification TfNSW 3357 Edition 3 Revision 2.

All revisions to the previous version (other than minor editorial and project specific changes) are indicated by a vertical line in the margin as shown here, except when it is a new edition and the text has been extensively rewritten.

### PROJECT SPECIFIC CHANGES

Any project specific changes are indicated in the following manner:

- (a) Text which is additional to the base document and which is included in the Specification is shown in bold italics e.g. ***Additional Text***.
- (b) Text which has been deleted from the base document and which is not included in the Specification is shown struck out e.g. ~~Deleted Text~~.

# **TfNSW QA SPECIFICATION 3357**

## **THERMOPLASTIC ROAD MARKING MATERIAL**

### **1 SCOPE**

This Specification sets out the material requirements for thermoplastic road marking compound suitable both for spray, screed and extrusion application and preformed thermoplastic for use as symbols, School Zone “40” (speed limit) markings, and transverse markings.

### **2 STRUCTURE OF THE SPECIFICATION**

This Specification includes a series of annexures that detail additional requirements unless specified as guidelines.

#### **2.1 (NOT USED)**

#### **2.2 (NOT USED)**

#### **2.3 TESTING PROCEDURES**

Testing procedures which are not detailed in a Test Method or standard method are detailed in Annexure 3357/L.

#### **2.4 REFERENCED DOCUMENTS AND DEFINITIONS**

Unless specified otherwise, the applicable issue of a referenced document, other than a TfNSW Specification, must be the issue current at the date one week before the closing date for tenders, or where no issue is current at that date, the most recent issue.

Standards, specifications and test methods are referred to in abbreviated form (e.g. AS 1234). For convenience, the full titles are given in Annexure 3357/M.

The term “the Supplier” means the supplier of the product covered by the scope of this Specification.

### **3 SUPPLIER’S QUALITY MANAGEMENT SYSTEM**

The Supplier must establish and maintain a Quality Management System complying with AS/NZS ISO 9001 as a means of ensuring that the product conforms to this Specification.

Provide evidence verifying compliance with this Clause.

## 4 MATERIAL REQUIREMENTS

A sample, when prepared in accordance with Annexure 3357/L Clause L1, must meet the requirements of this Clause.

### 4.1 COMPOSITION

The composition must comply with the requirements of AS 4049.2.

**Note:** For preformed School Zone “40” markings, the intermix glass bead component is replaced with +0.5, -2 mm angular quartz grit.

### 4.2 GRADING OF MINERAL CONTENT

The particle size distribution of the combined mineral content of the material, comprising aggregate, pigments, extenders and solid glass beads, as determined by Test Method TfNSW T855, must be as follows:

- (a) 100% by mass passing 2.80 mm;
- (b) 65 to 95% by mass passing 600 µm.

### 4.3 COLOUR

When a test panel, prepared in accordance with Annexure 3357/L Clause L2, is assessed in accordance with AS 1580.601.1, the colour (according to AS 2700S) must be as follows:

**White:** whiter than Y35 Off-White

**Yellow:** between Y12 Wattle or Y14 Golden Yellow

**Black:** to be no lighter than B64 Charcoal

### 4.4 LUMINANCE

When a specimen, prepared in accordance with Annexure 3357/L Clause L2, is measured according to Test Method TfNSW T1213, the luminance factor for as delivered material must be not less than:

- (a) 75 for white material;
- (b) 50 for yellow material;
- (c) No requirement for black material.

A line freshly applied to a road pavement without drop-on beads must have a luminance factor of not less than:

- (i) 65 for white material
- (ii) 40 for yellow material
- (iii) No requirement for black material.



#### **4.5 SOFTENING POINT**

When tested in accordance with the appropriate test method in AS 4049.2, the softening point must be within the range of 85°C to 105°C.

#### **4.6 HEAT STABILITY**

A test specimen, prepared in accordance with Annexure 3357/L Clause L2 using material which has been held with stirring at a temperature of  $200 \pm 5^\circ\text{C}$  for six hours in accordance with the appropriate test method in AS 4049.2, must have a luminance not greater than 5 units below that measured in Clause 4.4.

#### **4.7 ABRASION RESISTANCE**

When duplicate test specimens are prepared in accordance with Annexure 3357/L Clause L2 and tested in accordance with Test Method TfNSW T870, the Wear Index (average weight loss, mg, per 1000 cycles) must not exceed 650.

#### **4.8 DURABILITY**

The thermoplastic material must comply with the field testing requirements of AS 4049.2; *viz* degree of wear, skid resistance and luminance factor when tested in accordance with the specified relevant procedures.

**Note:** Preformed thermoplastic for School Zone “40” markings must be applied according to manufacturer’s recommendations.

### **5 PRODUCT CERTIFICATION**

Provide a certificate of compliance together with NATA endorsed test document listing test results which verify that the product complies with Clauses 4.1 to 4.8 of this Specification.

Certification must relate only to the formulation on which the tests were made and must be valid for not more than three years. New certification will be required whenever changes in product formulation are made.

**Note:** A test deck is available for lines to be applied and tested for compliance with Clause 4.8. Details can be obtained from the Laboratory Manager, TfNSW Southern Laboratory, 21 York Place, Russell Vale NSW 2517 (telephone 02 4222 3242).

### **6 PRODUCT IDENTIFICATION**

Clearly mark each container with the following information:

- (a) Name of supplier;
- (b) Product name and/or number;
- (c) Type of thermoplastic (spray, screed, extrusion or profile);
- (d) Batch number or date of manufacture;
- (e) Application temperature and maximum working temperature.

## **ANNEXURES 3357/A TO 3357/K – (NOT USED)**

### **ANNEXURE 3357/L – TESTING PROCEDURES**

#### **L1 SAMPLE PREPARATION**

##### **L1.1 Obtaining a Sub-Sample**

(a) Powdered Thermoplastic

Randomly select  $\sqrt[3]{N}$  bags of material where N = number of bags delivered. Riffle the whole of this sample to isolate a sub-sample of approximately 2 kg.

(b) Block Material

Break off a sufficient number of pieces from different parts of the block to obtain a sub-sample of approximately 2 kg.

##### **L1.2 Consolidation of Sub-Sample**

(a) Melt the whole sub-sample by heating it in a metal container on a hotplate to  $180 \pm 5^\circ\text{C}$  with stirring.

(b) Use the material within 1 hour of commencement of heating. Do not reheat.

#### **L2 PREPARATION OF TEST SPECIMENS**

##### **L2.1 Test Panels**

Test panels may be made of glass, aluminium or tin plate. They must be flat, smooth, free from distortion, ridges or cracks, and must be solvent-washed so that test specimens can be removed without being damaged.

##### **L2.2 Procedure**

(a) Sub-sample and melt the required quantity of material in accordance with Annexure 3357/L Clause L1.

(b) Pour the material onto the test panel promptly until a disc of approximately 2 mm thickness and the required diameter is formed.

(c) Allow the specimen to harden at  $23 \pm 3^\circ\text{C}$  and  $60 \pm 15\%$  relative humidity for at least 2 hrs.

(d) Carefully prise the test specimen from the panel using a spatula.

(e) Turn the specimen over and use the smooth surface for testing.

## **ANNEXURE 3357/M – REFERENCED DOCUMENTS**

Refer to Clause 2.4.

### **TfNSW Test Methods**

TfNSW T855	Gradation of Pigment of Thermoplastic Paint
TfNSW T870	Resistance to Taber Abraser
TfNSW T1213	Determination of the Luminance of a Surface

### **Australian Standards**

AS 1580	Methods of test for paints and related materials
AS 2700S	Colour standards for general purposes
AS 4049.2	Paints and related materials – Pavement marking materials – Thermoplastic pavement marking materials – For use with surface applied glass beads
AS/NZS ISO 9001	Quality management systems – Requirements