

## PAVEMENT MARKING MATERIAL – SOLVENT-BORNE PAINT

### 1 SCOPE

- a) This specification applies to solvent-borne paint for use as a pavement marking materials.
- b) This document is prepared in a manner compliant with the requirements of AS/NZS ISO/IEC 17065.
- c) This type of pavement marking material is applied to the following types of surfaces and areas, both in on-road and off-road applications, in order to increase their safe use:
  - i. Bituminous – Asphalt or Spray Seal roads
  - ii. Concrete roads
  - iii. Paved surfaces
  - iv. Car parks
  - v. Bus lanes, cycle lanes and pedestrian crossings
- d) Safe use of these pavement surfaces is facilitated through:
  - i. Brighter lines to separate traffic on both minor and major roads
  - ii. Introduced order in carparks and public spaces
  - iii. Delineation of roads
- e) APAS® is a trademark registered with IP Australia, owned by CSIRO, the Scheme Owner, and protected under applicable laws. Use of the trademark or the Certification Scheme is prohibited unless prior approval in writing is obtained from CSIRO via the APAS Secretariat.

### 2 BACKGROUND

- a) To obtain a broad overview of the Australian Paint Approval Scheme (APAS), refer to APAS document AP-D001.
- b) To obtain an overview of restricted ingredients in APAS certified products, refer to APAS document AP-D123.
- c) To obtain the current list of APAS participating manufacturers (and suppliers) and resellers, refer to APAS document AP-D152.
- d) To obtain an overview of how to participate in the APAS, refer to APAS document AP-D177.
- e) APAS approval to this specification may be gained by compliance with the requirements detailed in this specification and those in APAS document AP-D192.

### 3 DESCRIPTION AND GUIDE FOR USERS

#### 3.1 General Requirements

- a) Pavement marking materials are used by road authorities to:
  - i. Improve road safety and other surfaces used to carry all types of traffic including cars, trucks, pedestrians, cyclists, busses and aircraft.
  - ii. Provide delineation, acting as a guide to drivers to maintain their respective lane position, deterring accidents and providing direction.
- b) Because of these functions, pavement marking materials must withstand many different types of wear and still perform as required.
- c) When selecting a pavement marking material, several performance factors should be considered including, but not limited to, the roadway surface i.e., smooth or rough, heat sensitivity, porosity, traffic volume, and environmental conditions.

- d) Pavement marking material durability is dependent on many factors including, but not limited to, traffic volume, location of the lines, application rates, retroreflectivity, performance of the material under various traffic conditions, location of the lines and individual product durability. Depending on the circumstances, centre and lane lines can be painted yearly, and edge lines two-yearly but in high traffic volume areas, such lines can require repainting up to four times a year.
- e) Solvent-borne pavement marking paint has been widely used worldwide due to its ease of application as does not require heating, particularly in warmer weather. This type of material has generally been used in longitudinal line marking but has also been seen in transverse and other types of line marking.
- f) Solvent-borne materials, such as alkyd or chlorinated rubber, are used typically in undercover car parks that require improved dry times and adhesion to concrete - vital to time dependant maintenance opportunities - and where temporary markings are required in poor weather conditions. Solvent-borne materials are, however, used far less now due to their higher volatile organic compound (VOC) content. VOCs contribute to air pollution when the solvents photochemically react during evaporation.
- g) Solvent-borne paint is typically used with anti-skid media that consists of quartz, crushed glass, calcined bauxite aggregate or other approved materials that are angular, polishing-resistant and coloured to match the markings. This anti-skid media is used to improve skid resistance.
- h) Surface applied glass beads, such as B, B-HR, C, C-HR, D and D-HR, are also used in conjunction with paints to provide retroreflectivity under all conditions. The HR glass bead types have been adopted by the majority of road authorities for use in main road production and maintenance due to their superior retroreflectivity for only a small cost increase. Standard glass beads are generally used in car parking applications.

**NOTE:** Glass beads are certified by APAS under specification AP-S0042.

#### 3.2 Sub-Classes

- a) This specification incorporates the following sub-classes:
  - i. **0041/2.1:** Brush and/or roller application (slow dry paint)
  - ii. **0041/2.2:** Spray application (rapid dry paint)

#### 3.3 Basis of this Specification

- a) This specification is based on AS 4049.1, industry standards and specifications, and road authority standards and specifications.

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### 4 DEFINITIONS AND ACRONYMS

#### 4.1 Definitions

The definition of terms used in this document and in the Certification Scheme can be found in APAS document AP-D001. In addition, the following definitions within this document shall apply:

- a) **Agency for Conformity Assessment:** An organisation or testing authority, recognised by APAS, that is either part of the Clients Recognised Manufacturing Unit (RMU) and perform all of the required tests, or a specialist laboratory contracted either by the APAS Secretariat or by the Client, to carry out specific tests that are beyond the capability of the Client RMU.
- b) **Certification Scheme:** The Certification system related to specified products (Paint, Surface Coating Materials and Non-Paint Products) to which the same specified requirements, specific rules and procedures apply. APAS is the applicable Certification Scheme.
- c) **Longitudinal Line Markings:** All lines that are generally parallel to the traffic flow, such as dividing, barrier, lane, edge, turn, continuity and transition lines and outline markings.
- d) **Pavement Markings:** All longitudinal line markings, transverse line markings and pavement messages for the purpose of guiding traffic.
- e) **Retroreflectivity:** The value of reflected light measured in millicandela / square metre / incident lux (mcd/m<sup>2</sup>/lx) using a retroreflectometer.
- f) **Scheme Owner:** The organisation responsible for developing and maintaining the certification scheme. CSIRO is the APAS Scheme Owner.
- g) **Secretariat:** The organisation that provides administrative support and other resources necessary to keep the Certification Scheme functioning. The Secretariat is vested in CSIRO.
- h) **Transverse Line Markings:** All lines and markings that are marked at right angles to the traffic flow such as stop and give way lines, turn lines, markings at stop and give way signs, pedestrian crossway lines, diagonal and chevron markings, arrows, shapes, symbols, numerals, parking areas and kerb markings.

#### 4.2 Acronyms

<b>ACE</b>	Agency for Conformity Assessment
<b>APAS</b>	Australian Paint Approval Scheme
<b>CRCL</b>	CSIRO Recognised Competent Laboratory
<b>CSIRO</b>	Commonwealth Scientific and Industrial Research Organisation
<b>EO</b>	Executive Officer, APAS
<b>PDS</b>	Product Data Sheet
<b>RMU</b>	Recognised Manufacturing Unit
<b>SDS</b>	Safety Data Sheet
<b>SUSMP</b>	Standard for the Uniform Scheduling of Medicines and Poisons
<b>TDS</b>	Technical Data Sheet
<b>VOC</b>	Volatile organic compounds
<b>WHS</b>	Workplace Health and Safety

### 5 REFERENCED DOCUMENTS

- a) The following standards are referenced in this document:
  - i. **AS 1152** – Specification for test sieves (withdrawn)
  - ii. **AS/NZS 1580** – Paints and related materials: Methods of test.
  - iii. **AS/NZS 2009** – Glass beads for pavement-marking materials
  - iv. **AS 2700** – Colour standards for general purpose
  - v. **AS 4049.1** – Paints and related materials - Pavement marking materials – Part 1: Solvent-borne paint - For use with surface applied glass beads
  - vi. **AS 4049.4** – Paints and related materials – Pavement marking materials – Part 4: High performance pavement marking systems
  - vii. **AS 4049.5** – Paints and related materials – Pavement marking materials – Part 5: Performance assessment of pavement markings
  - viii. **AS 4663** – Slip resistance measurement of existing pedestrian surfaces
  - ix. **AS ISO/IEC 17025** – General requirements for the competence of testing and calibration laboratories
  - x. **AS/NZS ISO/IEC 17065** – Conformity assessment: Requirements for bodies certifying products, processes and services

These documents may be purchased through the Reference Standards Australia website:

<https://www.standards.org.au/>

- xi. **The Poisons Standard June 2021:** Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) No. 33, Part 2: Control on Medicines and Poisons, Section Seven / Appendix I Paint or Tinters

This document is available from the Australian Government Federal Register of Legislation website at:

<https://www.legislation.gov.au/Details/F2021L00650>

- xii. **Test Method TP343 – Determination of Skid Resistance with the Micro Griptester** DPTI (Department of Planning, Transport & Infrastructure), Technical Services Group Procedures

This document is available from the DPTI website:

[https://www.dpti.sa.gov.au/materials\\_technology\\_documents/test\\_procedures2](https://www.dpti.sa.gov.au/materials_technology_documents/test_procedures2)

- b) The following documents were utilised in the creation of this document:
  - i. Austroads Technical Specification ATS 4110: Longitudinal Pavement Marking
  - ii. NZTA P30: Specification for High Performance Roadmarking
  - iii. QA Specification R145 Pavement Marking (Performance Based), Transport for NSW (TfNSW)
  - iv. QA Specification 3351 Road Marking Paint, Transport for NSW (TfNSW)

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- v. RIAA Industry Guide: Series 1 – Facilities Pavement Marking, 1.1 Off Street Parking Facilities Marking Guide
  - vi. Section 721 – Pavement Markings, VicRoads
  - vii. Section 971 – Traffic Marking Materials, Florida Department of Transport
  - viii. Specification 604: Pavement Marking, Main Roads QA
  - ix. SWA-0-QA-SPE-0610 Pavement Marking (All Lane Running Section), SmartWays Alliance
  - x. Transport and Main Roads Specifications MRTS45 Road Surface Delineation
- c) The following APAS documents are referenced in this document:
- i. AP-D001 Rules Governing How APAS® Operates
  - ii. AP-D114 Rules Governing APAS® Recognition as a Testing Authority
  - iii. AP-D123 Restrictions on Ingredients in Product Formulations
  - iv. AP-D152 APAS® Participating Manufacturers and Resellers
  - v. AP-D177 Rules Governing How Product Manufacturers participate in APAS®
  - vi. AP-D181 Volatile Organic Compounds (VOC) Limits
  - vii. AP-D192 Rules Governing APAS® Product Certification Scheme
  - viii. AP-S0042 Glass Beads – For use in and with Pavement Marking Materials

All APAS documents and specifications are available for download from the APAS website:

<https://vs.csiro.au/apas/documents/>  
<https://vs.csiro.au/apas/specifications/>

### 6 COMPOSITIONAL AND GENERAL REQUIREMENTS

#### 6.1 Binder

- a) There are no restrictions placed on the type of binder used in solvent-borne pavement marking paints.
- b) Primary importance is placed on the ability of the binder to be compliant with the technical requirements of clause 8, Table 1 below.

#### 6.2 Volatiles

- a) The volatile portion shall principally be comprised of volatile non-aqueous solvents.
- b) For VOC content restrictions, refer to APAS document AP-D181.

#### 6.3 Pigmentation

- a) Pigments used shall be non-toxic, non-corrosive, lead-free and either organic or inorganic in nature (for coloured products), complying with the requirements of the SUSMP.
- b) Primary importance is placed on the ability of the pigmentation to be compliant with the technical requirements of clause 8, Table 1 below.

#### 6.4 Colour

- a) Longitudinal and transverse pavement markings are typically white and yellow.
- b) Transverse (and other pavement markings) can also be a variety of colours, typically but not limited to white, yellow, red (bus lanes), green (cycle lanes), blue, grey and black. Refer to the manufacturer's Technical Data Sheet (TDS) or Product Data Sheet (PDS) for further information.

### 7 PRODUCT APPROVAL REQUIREMENTS

#### 7.1 General Requirements

- a) The product and its application for approval shall comply with the relevant requirements of this specification and of APAS document AP-D192 during the life of the approval.
- b) Upon successful assessment of the laboratory component of this specification, CLASS II (interim) certification may be awarded in order to undertake the field testing component. Three (3) years from date of certificate issue is the timeframe given in order to undertake this work.
- c) After successful assessment of the field testing component of this specification, CLASS I (full) certification may be awarded for the balance of the standard seven (7) year certification period i.e., 4 years.

#### 7.2 Technical Requirements

- a) **Current Requirements:** All laboratory testing must be completed as per the requirements of clause 8, Table 1 by an ACE. All performance based field testing must be carried out by a CRCL (refer to Note B) within the CLASS II certification period.
- b) **Future Requirements:** All laboratory testing and field testing requirements stated in clause 8, Table 1 must be undertaken by an AS ISO/IEC 17025 accredited laboratory with all applicable test methods included in their Scope of Accreditation. A grace period will exist in order for all testing facilities to achieve AS ISO/IEC 17025 accreditation. This Grace period will end on **31<sup>st</sup> July 2023**.
- c) AS ISO/IEC 17025 accreditation shall be provided by an organisation accredited by an ILAC Mutual Recognition Arrangement signatory and having a Scope of Accreditation covering AS ISO/IEC 17025 requirements. In Australia, NATA provides AS ISO/IEC 17025 accreditation. A list of international ILAC accreditation bodies can be found on the ISO website.
- d) Performance based testing is typically to be undertaken on the **white** product only due to coloured materials representing lower market volumes, making them exempt from field testing. This exemption only exists **provided that** coloured materials are based on the same formulation (specifically the binder system) as the white product. Yellow products of the same formulation can be substituted in the absence of white.
- e) If a coloured material is the only product seeking certification, then it must also undertake the



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performance-based testing requirements of clause 8, Table 1.

### 7.3 Health and Safety Requirements

- a) The product shall comply with all requirements of clause 6.3 and 6.4 of APAS document AP-D192.
- b) The manufacturer's Safety Data Sheet (SDS) must be studied closely prior to using the product and complied with during use of the product.
- c) Solvent-borne paint is flammable and should be stored away from all sources of heat or ignition.
- d) Solvent-borne paint containers should be resealed immediately after use and good ventilation provided during use to minimise the risk of fire or explosion and the long-term toxic effects of absorption of the vapour into the lungs.
- e) Care should be taken to avoid contact with the skin using protective clothing and barrier cream where necessary.
- f) Products intended for sale in Australia shall comply with all the requirements of the SUSMP. Products intended for sale in other countries shall comply with all local WHS and environmental requirements.



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### 8 TABLE 1: PERFORMANCE PROPERTIES

TEST:	APPLICABLE STANDARD / TEST REFERENCE:	REQUIREMENTS:
<b>Laboratory Testing Requirements <sup>A</sup></b>		
<b>Condition in the Container</b>	AS 4049.1 (clause 7.1.1) AS/NZS 1580.103.1 AS/NZS 1580.211.1	Tested at 4 weeks from the date of product manufacture, the Settling Rate is to be not less than 8 and material to be free from skin, lumps, gel and coarse particles - report results.
<b>Fineness of Paint</b>	AS 4049.1 (clause 7.1.2 and Appendix D) AS 1152	Not more than 0.1% paint remaining - report results.
<b>Consistency</b>	AS 4049.1 (clause 7.1.3) AS/NZS 1580.214.1	Within ±5% of manufacturers specification - report results.
<b>Application Properties</b>	AS 4049.1 (clause 7.1.4) AS/NZS 1580.205.1 AS/NZS 1580.205.3 AS/NZS 1580.205.2 AS/NZS 1580.205.4	Smooth and uniform film, with even edges. If applied by spray application, there should be no objectionable splatter and the gun does not clog under normal requirements - report results.
<b>No-Pick-Up Time</b>	AS 4049.1 (clause 7.1.5) AS/NZS 1580.401.8	<b>0041/2.1:</b> > 5 to < 15 minutes - report results. <b>0041/2.2:</b> ≤ 5 minutes - report results.
<b>Colour</b>	AS 4049.1 (clause 7.1.6 and Appendix F) AS/NZS 1580.601.1 AS 2700	<p><b>White:</b> Approximate match to N14 White. Alternative colour is whiter than Y35 Off white.</p> <p><b>Yellow:</b> Approximate match to Y14 Golden Yellow. Alternative colours are Y12 Wattle, Y13 Vivid Yellow, Y15 Sunflower.</p> <p><b>Red:</b> Approximate match to R13 Signal Red. Alternative colours are R53 Redgum, R54 Raspberry or R62 Venetian Red.</p> <p><b>Blue:</b> Approximate match to B21 Ultramarine. Alternative colours are B12 Royal Blue, B23 Bright Blue, B24 Harbour Blue or B41 Bluebell.</p> <p><b>Green:</b> Approximate match to G13 Emerald Green. Alternative colours are G16 Traffic Green, G23 Shamrock or G35 Lime Green.</p> <p><b>Black:</b> Approximate match to B64 Charcoal. Alternative colour is N61 Black</p> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>Alternative colours (i.e., grey) may also be tested as per requirements of road authorities.</li> <li>Colours must be compared to and equivalent to a known AS 2700 colour. State colour designation and results.</li> <li>No glass beads (surface applied) are to be included with grey and black coloured materials.</li> </ul>





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TEST:	APPLICABLE STANDARD / TEST REFERENCE:	REQUIREMENTS:												
<b>Laboratory Testing Requirements <sup>A</sup> (Cont.,)</b>														
<b>Specular Gloss</b>	AS 4049.1 (clause 7.1.7 and Appendix F) AS/NZS 1580.602.2	≤ 20 gloss units (using a 60 degree head) - report results  <b>NOTE:</b> Alternative gloss levels will be considered on a case by case basis by the APAS EO as any new product innovations develop.												
<b>Luminance Factor</b>	AS 4049.1 (clause 7.1.8, Appendix G, Method 1)	<b>White:</b> ≥ 80 % - report results. <b>Yellow:</b> ≥ 50 % - report results. <b>Black:</b> ≤ 5 % - report results. <b>Grey:</b> > 5 % - < 15 % - report results. <b>Other Colours:</b> ≥ 15 % - report results.												
<b>Resistance to Bleeding</b>	AS 4049.1 (clause 7.1.9 and Appendix E)	≥ 4 on grey scale - report results.												
<b>Storage Properties</b>	AS 4049.1 (clauses 7.1.10, 7.1.4 and Appendix C) AS/NZS 1580.214.1 AS/NZS 1580.103.1 AS/NZS 1580.211.1 AS/NZS 1580.211.2	<ul style="list-style-type: none"> <li>Change does not exceed ± 5 Krebs Units (KU) from initial value. Report Initial and storage values.</li> <li>No skinning.</li> <li>Settling rate &gt; 4.</li> <li>Readily reincorporated.</li> </ul> Report all results.												
<b>Volatile Organic Content (VOC)</b>	APAS AP-D181	> 250 and < 500 g/L Report results.												
<b>Performance Based Testing Requirements (Field Testing) <sup>A, B</sup></b>														
<b>Setting up Performance Based Testing: Applicable Standard / Test Reference and Requirements</b> <ul style="list-style-type: none"> <li>Refer to AS 4049.1 (clause 7.2 and Appendix H)</li> <li>*Products applied with wet film thickness 375 µm ± 25 µm (or manufacturer's specified wet/dry film thickness) using Type B-HR glass beads at 300 g/m<sup>2</sup> ± 25 g/m<sup>2</sup> bead rate.</li> </ul> <p><b>NOTE:</b> *Variations to this can be made on a case to case basis dependant on the material under test, the glass bead requirements of this material and via prior arrangement with the APAS EO.</p> <p>Measurements are to be taken at three intervals as specified below and all values reported:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">Substrate Type:</th> <th style="width: 25%;">Initial Measurement Point (IMP):</th> <th style="width: 25%;">Interim Measurement Point (INMP):</th> <th style="width: 25%;">Final Measurement Point (FMP):</th> </tr> </thead> <tbody> <tr> <td>Asphalt (or other substrate types)</td> <td>After application / cure</td> <td>2,000,000 vehicle passes</td> <td>4,000,000 vehicle passes<sup>^</sup></td> </tr> <tr> <td>Spray Seal</td> <td>After application / cure</td> <td>500,000 vehicle passes</td> <td>1,000,000 vehicle passes<sup>^</sup></td> </tr> </tbody> </table> <p><b>NOTE:</b> <sup>^</sup> Substrates must be subjected to specified number of vehicle passes in a 3 to 18 month period post application.</p>			Substrate Type:	Initial Measurement Point (IMP):	Interim Measurement Point (INMP):	Final Measurement Point (FMP):	Asphalt (or other substrate types)	After application / cure	2,000,000 vehicle passes	4,000,000 vehicle passes <sup>^</sup>	Spray Seal	After application / cure	500,000 vehicle passes	1,000,000 vehicle passes <sup>^</sup>
Substrate Type:	Initial Measurement Point (IMP):	Interim Measurement Point (INMP):	Final Measurement Point (FMP):											
Asphalt (or other substrate types)	After application / cure	2,000,000 vehicle passes	4,000,000 vehicle passes <sup>^</sup>											
Spray Seal	After application / cure	500,000 vehicle passes	1,000,000 vehicle passes <sup>^</sup>											



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TEST:	APPLICABLE STANDARD / TEST REFERENCE:	REQUIREMENTS:								
<b>Performance Based Testing Requirements (Field Testing) <sup>A, B</sup> (Cont.,)</b>										
<b>Degree of Wear</b>	AS 4049.1 (clause 7.2.2 and Appendix K)	<b>Asphalt:</b> ≥ 70% paint remaining intact at FMP <b>Spray Seal:</b> ≥ 65% paint remaining intact at FMP Report all results.								
<b>Dry Retroreflectivity</b>	AS 4049.1 (clause 7.2.3 and Appendix I)	Longitudinal and Transverse (and other markings) <table border="1" style="margin-top: 10px; width: 100%;"> <thead> <tr> <th style="background-color: #D9E1F2;">Substrate Type:</th> <th style="background-color: #D9E1F2;">IMP mcd/m<sup>2</sup>/lx</th> <th style="background-color: #D9E1F2;">INMP mcd/m<sup>2</sup>/lx</th> <th style="background-color: #D9E1F2;">FMP mcd/m<sup>2</sup>/lx</th> </tr> </thead> <tbody> <tr> <td>All substrate types</td> <td>≥ 250</td> <td>≥ 200</td> <td>≥ 150</td> </tr> </tbody> </table> Report all results.	Substrate Type:	IMP mcd/m <sup>2</sup> /lx	INMP mcd/m <sup>2</sup> /lx	FMP mcd/m <sup>2</sup> /lx	All substrate types	≥ 250	≥ 200	≥ 150
Substrate Type:	IMP mcd/m <sup>2</sup> /lx	INMP mcd/m <sup>2</sup> /lx	FMP mcd/m <sup>2</sup> /lx							
All substrate types	≥ 250	≥ 200	≥ 150							
<b>Wet Retroreflectivity</b>	AS 4049.4 (clause 6.3.3, Table 4, Appendix K Method 2)	<b>Applicable to all substrate types and all colours (except grey and black):</b> ≥ 80 mcd/m <sup>2</sup> /lx at all times - report results. <b>NOTE:</b> Measurements to be taken at IMP, INMP, FMP and results reported.								
<b>Luminance</b>	AS 4049.1 (clause 7.2.4, Appendix G Method 2)	<b>White:</b> Lighter than Natural Colour System (NCS) swatch S 2500-N - report results. <b>Yellow:</b> Approximate match to Natural Colour System (NCS) swatch S 1070-Y20R - report results. <b>NOTE:</b> This is applicable to white and yellow materials only, refer to Colour Change for all other colours.								
<b>Colour Change</b>	AS 4049.4 (clause 6.3.8 and Appendix G)	All colours assessed at IMP, INMP, FMP testing points must have results ≥ 3 on grey scale - report results. <b>NOTE:</b> Only colours are assessed in this method, refer to Luminance for white and yellow material testing.								
<b>Skid Resistance</b>	AS 4049.4 (clause 6.3.5 and Appendix J) and/or TP343	≥ 45 BPN or ≥ 0.55 Grip Number – report results. <b>NOTE:</b> Must be tested at two pre-determined locations within the field testing area and locations reported.								
<b>Slip Resistance</b>	AS 4049.4 (clause 6.3.6) AS 4663 Appendix A and Table A1	≥ 35 BPN – report results.								
<b>Visibility</b>	AS 4049.5 (clause 8.3.1 and Appendix C)	Markings must be easily recognisable and clearly visible and must meet the minimum visual performance levels for Transverse (and other) markings (Table C1) or Longitudinal markings (Table C2), whichever is applicable.  A minimum of 5 testing locations over the length of a road must be assessed. Record and report all measurements, the weather, on-road and lighting conditions. Report all results.								



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**NOTE:**

**A:** Laboratory Testing must be conducted by an ACE and field testing by a CRCL. From **31<sup>st</sup> July 2023**, all laboratory and field testing must be carried out by an AS ISO/IEC 17025 accredited facility with all applicable testing under its Scope of Accreditation. The NATA website can assist in identifying an appropriate testing facility <https://www.nata.com.au/>

**B:** Performance Based Testing (Field Testing) can be conducted by the following CRCLs:

Australian Road Research Board (ARRB)  
David Milling  
Team Leader, Transport Safety  
21 McLachlan Street, Fortitude Valley, QLD, 4006  
Phone: +61 438 859 779  
Email: [david.milling@arrb.com.au](mailto:david.milling@arrb.com.au)

Department for Infrastructure & Transport – South Australia  
George Spartalis  
Technical Officer  
Photometrics Laboratory, Road Asset Management  
Services  
Phone: +61 8 8260 0578  
Email: [george.spartalis@sa.gov.au](mailto:george.spartalis@sa.gov.au)





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### 9 APPENDIX A

#### Document History

Status: Current  
 Version: 0  
 Date Published: 29-07-2021

Document Version No.:	Date Published:	Summary of Changes:
0 AP-S0041/2	29-07-2021	<ul style="list-style-type: none"> <li>• Full Technical document review of APAS specification 0041</li> <li>• Separation of original specification (AP-S0041 V11) into pavement marking material types (Solvent-borne, CAP, Thermoplastics, Water-borne and Airport Pavement Markings); this document is now referenced as AP-S0041/2 Pavement Marking Material – Solvent-Borne Paint</li> <li>• Document brought in line with requirements of AS/NZS ISO/IEC 17065</li> <li>• General formatting update</li> <li>• Updated to include clause 3.2, two sub-classes - 0041/2.1 and 0041/2.2</li> <li>• Inclusion of clause 4 Definitions and Acronyms</li> <li>• Inclusion of clause 5 b) Reference material</li> <li>• Revision of laboratory based testing parameters for Colour, Specular Gloss, Luminance Factor and VOC</li> <li>• Expansion and revision of performance based testing parameters (field testing) relating to increased number of minimum vehicle passes, dry and wet retroreflectivity, colour change, slip and skid resistance and visibility</li> <li>• Inclusion of alternative CRCL for Field Testing - ARRB</li> </ul>
11 AP-S0041	10-11-2020	<ul style="list-style-type: none"> <li>• Addition of Appendix A Document History and removal of the Editorial Note previously used in specification versions</li> <li>• Updated document to the current format</li> <li>• Updated internal and external document references</li> <li>• Inclusion of VOC Content requirement to Table 1 Performance Properties</li> <li>• Updated Note C contact information</li> <li>• Addition of “People + Product = Protection” to Footer</li> </ul>
10	16-10-2015	<ul style="list-style-type: none"> <li>• Clarified requirements for runway, apron and taxiway markings for sub-class 0041/6</li> </ul>
9	23-03-2015	<ul style="list-style-type: none"> <li>• Underwent a major revision with the inclusion of requirements for sub-class 0041/3 cold applied products and 0041/6 airport marking</li> </ul>
8	10-01-2013	<ul style="list-style-type: none"> <li>• Added sub-class 6, underwent a general update and the field-testing details in Table 1 were updated</li> </ul>
7	03-05-2007	<ul style="list-style-type: none"> <li>• Aligned the specification with the revised AS 4049 – 2005</li> </ul>
6	13-02-2001	<ul style="list-style-type: none"> <li>• Initiated the second stage of the move to new specification numbering with prominence given to the new number (previously GPC-P-41)</li> </ul>