



## VOLATILE ORGANIC COMPOUNDS (VOC) LIMITS

### 1 SCOPE

- This document details the limits on Volatile Organic Compounds (VOC) content for products applying for accreditation to APAS specifications noted in Appendix A Table 1 and Table 2 of this document.
- This document is prepared in a manner compliant with the requirements of AS/NZS ISO/IEC 17065
- VOC levels of all products applying for certification / re-certification must be stated regardless of the APAS specification they are applying for.
- 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 DEFINITIONS AND ACRONYMS

#### 2.1 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:

- Agency for Conformity Evaluation:** An organisation or testing authority that is either part of the Clients Recognised Manufacturing Unit (RMU) and performs all or the majority of the required tests, or is 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 (refer to APAS document AP-D114).
- Certified Product:** A product that has been assessed by an APAS Officer and found to comply with the Product and Certification Requirements. Historically referred to as an Approved Product.
- Certification Requirement:** The specified requirement(s), including product requirement(s), that is fulfilled by the Client as a condition of establishing or maintaining certification.
- Certification Scheme:** The Certification system related to specified products (Paint and Non-Paint Products) to which the same specified requirements, specific rules and procedures apply. APAS is the applicable Certification Scheme.
- Client:** The organisation responsible to the Certification Body (APAS) for ensuring that certification requirements, including product requirements, are fulfilled. The Client nominates a person(s) directly responsible (APAS Signatory) within its organisation, and to communicate directly with the Certification Scheme (APAS).
- Product Requirement:** The specified requirement(s) that relates directly to a product, specified in standards or in other normative documents (APAS Specifications) identified by the Certification Scheme (APAS).
- Recognised Manufacturing Unit (RMU):** A company voluntarily choosing to participate in the Certification Scheme (APAS) whereby its manufacturing facilities have been assessed in accordance with AP-D177 for

supply of products certified to APAS Specifications. The RMU forms part of the Client. Historically referred to as the Supplier.

- Scheme Owner:** The organisation responsible for developing and maintaining the certification scheme. CSIRO is the APAS Scheme Owner.
- Secretariat:** The organisation that provides administrative support and other resources necessary to keep the Certification Scheme functioning. The Secretariat is vested in CSIRO.
- Surface Coating:** Any mix of film-forming materials plus pigments, solvents and additives, that create a thin film when applied to a surface, where it then cures and dries. Surface coatings are primarily functional, often decorative, and include but are not limited to, paints, drying oils, varnishes, pavement marking materials, protective coatings and specialty materials.
- Volatile Organic Compound<sup>1,2,3</sup>:** A chemical compound, based on carbon chains or rings, present in coating formulations, either as a unique ingredient or as a compound of an ingredient / manufactured intermediate, that participates in atmospheric photochemical reactions (forming ozone) in vapour form that has:
  - A vapour pressure > 0.01mm Hg at 21°C, or
  - An initial boiling point < 250°C measured at a standard pressure of 101.3 kPa

**NOTE<sup>1</sup>:** A material that is specifically **included** as being a VOC is Ammonia.

**NOTE<sup>2</sup>:** A materials that is specifically **excluded** as being a VOC due to their negligible atmospheric photochemical reactivity is Acetone.

**NOTE<sup>3</sup>:** The following are VOC levels and their classification as defined by APAS:

APAS Classification	VOC (grams per litre, g/L)
Very High	> 250
High	100 – 249
Moderate	50 – 99
Low	5 – 49
Very Low <sup>4</sup>	< 5

**NOTE<sup>4</sup>:** Refer to clause 16 for a guide in the determination of a Very Low classification.

#### 2.2 Acronyms

The following acronyms appear in this document:

<b>ACE</b>	Agency for Conformity Evaluation
<b>APAS</b>	Australian Paint Approval Scheme
<b>APMF</b>	Australian Paint Manufacturers' Federation
<b>ATAP</b>	APAS Technical Advisory Panel
<b>CEPE</b>	European Council of Paint, Printing Ink and Artists' Colours Industry
<b>CRCL</b>	CSIRO Recognised Competent Laboratory
<b>CSIRO</b>	Commonwealth Scientific and Industrial Research Organisation
<b>EO</b>	Executive Officer – APAS
<b>GECA</b>	Good Environmental Choice Australia
<b>g/L</b>	Grams per Litre

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<b>NATA</b>	National Association of Testing Authorities
<b>NOx</b>	Nitrogen oxides
<b>RMU</b>	Recognised Manufacturing Unit
<b>TVOC</b>	Total Volatile Organic Compounds
<b>VOC</b>	Volatile Organic Compounds

### 3 AUTHORITIES AND RESPONSIBILITIES

- a) The Executive Officer (EO) of the Certification Scheme (APAS) is responsible for:
- The content of this document, and
  - Ensuring submission(s) by Clients who seek certification of products (Certified Product) or recertification of a Certified Product, show conformance to the noted VOC limits and having fulfilled its Certification Requirements and Product Requirements as they relate to an APAS specification(s) listed in Appendix A (Tables 1 and 2).

### 4 REFERENCED DOCUMENTS

- a) The following standards are referenced in this document:
- ASTM D2369** – Standard Test Method for Volatile Content of Coatings
  - ASTM D3960** – Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings
  - ASTM D6886** – Standard Test Method for Determination of the Weight Percentage Individual Volatile Organic Compounds in Waterborne Air-Dry Coatings by Gas Chromatography
  - ISO 3251** – Paints, varnishes and plastics – Determination of non-volatile-matter content
  - 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/>

- b) The following APAS documents are referenced in this document:
- AP-D001 Rules Governing How APAS® Operates
  - AP-D004 Rules Governing Appeals and Complaint Handling
  - AP-D114 Rules Governing APAS® Recognition as a Testing Authority
  - AP-D139 Application Form for Product Certification - Manufacturer
  - AP-D150 Rules Governing How Specifying Organisations become Members of APAS® & PCCP®
  - AP-D177 Rules Governing How Product Manufacturers Participate in APAS®
  - AP-D182 Statement of Volatile Organic Compounds (VOC) Content in Product
  - AP-D183 Guidelines for Changes to Formulation of Approved Products
  - AP-D192 Rules Governing APAS® Product Certification Scheme

- x. AP-T002 Determination of the Surface Emission Characteristics of a Coating for use in Building Interiors

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/>

- c) The following documents were utilised in the creation of this document:
- A Guide to VOC Reduction in Decorative Coatings** by CEPE
  - CEPE position on the term 'Solvent-free' Protective Coatings** by CEPE
  - VOCs from Surface Coatings – Assessment of the Categorisation, VOC Content and Sales Volumes of Coating Products Sold in Australia** by ENVIRON Australia Pty Ltd 2009 (prepared for NEPC Service Corporation on behalf of the Environment Protection Heritage Council)
  - NPI Volatile Organic Compound Definition and Information** by Department of Environment, Water, Heritage and the Arts, Australian Government
  - Good Environmental Choice Australia (GECA) – Environment Performance Standard – Paints and Coatings** Reference No.: PCv2.2-2012, issued: 28 March 2018
  - Direct Methods for Analysing Volatile Organic Compounds in Coatings** by Max T. Wills and Dane R. Jones, ASTM Standardisation News, November 2006
  - Development of an Improved VOC Analysis Method for Architectural Coatings** (Prepared for California Air Resources Board and the California EPA) by Dane R. Jones, Professor and Max T. Wills, Professor Emeritus, Department of Chemistry and Biochemistry, California Polytechnic State University, revised February 27, 2009

### 5 BACKGROUND

- To obtain a broad overview of the Australian Paint Approval Scheme (APAS), refer to APAS document AP-D001.
- To obtain a broad overview of the rules governing how to appeal a decision made by APAS and/or lodge a complaint against an APAS officer, refer to APAS document AP-D004.
- To obtain an overview of how to participate in the APAS, refer to APAS document AP-D177.
- To obtain the current list of APAS participating manufacturers (and suppliers) and resellers, refer to APAS document AP-D152
- To obtain a broad overview of the rules governing the APAS product certification scheme, refer to APAS document AP-D192
- To complete a Statement of Volatile Organic Compounds (VOC) Content in a Product, refer to APAS document AP-D182.

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### 6 INTRODUCTION

#### 6.1 Technical

- a) VOC emissions from surface coatings result from the evaporation of solvents, and other organic compounds, from both waterborne and solventborne coatings.
- b) VOCs produced in relation to surface coating products originate from several sources including, but not limited to:
  - i. Evaporation from tanks during the manufacturing process
  - ii. Drying / curing of applied films
  - iii. Cleaning up post-application
  - iv. Disposal of unwanted materials
- c) VOCs contribute negatively to air pollution by participating in atmospheric photochemical reactions with other emissions, such as nitrogen oxides from vehicles, producing air pollution effects such as ozone production and smog.
- d) The **Guide to VOC Reduction in Decorative Coatings** produced by the CEPE (European Industrial Council for Paints, Printing Inks and Artists' Colours) Technical Committee Decorative Paints states:
 

*"The action of sunlight on NOx and VOCs leads to the formation of ground level ozone, a long-range pollutant, which can impact on rural areas at some distance from the original source of emission. Ozone can irritate the eyes and lungs, causing breathing difficulties, and may reduce resistance to infection. Ozone can also damage some vegetation, crops and trees. Ozone levels are normally higher on still, sunny, summer days, when the air is already polluted with NOx and VOCs (e.g., urban areas with traffic). Because of the time required for the chemical reactions to take place, ozone formation tends to occur downwind of the pollution. The resulting smog may persist for several days and can be transported over long distances"*.
- e) VOCs also contribute negatively to indoor air quality through emissions, both during and after curing, into the daily living environment. As a result, they can impact on individual health and well-being including personal allergic reactions. This aspect of VOCs is not the subject of this document.
- f) Previous methods used for the determination of VOC content of surface coatings were determined to be inadequate when applied to all coating types. This, and future document versions, will address these concerns and advise of updated methods as they are developed. This document version includes two additional test methods:
  - i. Clause 7.3, Method 3
  - ii. Clause 7.4, Method 4

#### 6.2 Historical

- a) APAS has been setting limits for VOC content of certified products since 1996.
- b) Progressive reductions have been made over this period and this document version details the latest round of reductions which have been arrived at in line with GECA, APMF and ATAP.
- c) The limits set in this document apply only to APAS certified products sold in Australia and New Zealand.

### 7 DETERMINATION OF VOC CONTENT<sup>9,10</sup>

The VOC content of a surface coating material shall be determined by **one or more** of the following methods:

- 7.1 METHOD 1:** Determined by calculation using the suppliers' raw material data.
- i. Applying the definition of a VOC as noted in clause 2.1 k), determine the VOC content for every raw material / intermediate in the formulation.
  - ii. Tally the VOC content of every raw material / intermediate in the formulation to determine the total VOC content of the formulation<sup>5</sup>.

**NOTE<sup>5</sup>:** Where the supplier fails to report VOC content for the ingredient in accordance with the above definition, or where the intermediate formula is not known, the VOC content must be determined as per clause 7.2, 7.3 or 7.4 below, as applicable.

- 7.2 METHOD 2:** Determined experimentally in accordance with ASTM D3960<sup>6</sup>.
- i. Determine the weight percent non-volatile content (and hence the volatile content) by ASTM D2369 (60 minutes at 110 ± 5°C).
  - ii. Convert the figure determined in 7.2 i. above to g/L, as per ASTM D3960.

**NOTE<sup>6</sup>:** The method described in clause 7.2 is inappropriate for constituents that decompose at elevated temperature and for coatings with very low VOC content, particularly those that are waterborne. Products within these categories shall perform VOC determination via clause 7.3 Method 3, where applicable.

- 7.3 METHOD 3:** Determined experimentally in accordance with ASTM D6886<sup>7</sup>.
- i. Determine the weight percentage of individual volatile organic compounds by ASTM D6886.
  - ii. Convert the figures obtained in 7.3 i. to g/L and combine to determine the overall VOC content of the coating.

**NOTE<sup>7</sup>:** The method described in 7.3 is suited to very low VOC content coatings, particularly waterborne air-drying coatings, and can also be used for coatings containing silanes, siloxanes and silane-siloxane blends. This method is not suitable for coatings that cure by chemical reaction, including two-component coatings and coatings that cure when heated.

- 7.4 METHOD 4:** Determined experimentally in accordance with APAS technical document AP-T002.
- i. Determine the Total Volatile Organic Compounds (TVOC) likely to be released from a curing coating.
  - ii. Express results obtained as TVOC (µg/m<sup>2</sup>/hr)<sup>8</sup>.

**NOTE<sup>8</sup>:** The method described in clause 7.4 is specifically relating to products seeking certification to APAS specification 0209/1L and 0209/2L **only**.

**NOTE<sup>9</sup>:** The VOC shall be expressed to include any thinning solvent recommended as mandatory on the label or data sheet for the method of application proposed.

**NOTE<sup>10</sup>:** Tinter additions are excluded from VOC calculations.

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### 8 ACCREDITED AGENCIES FOR CONFORMITY EVALUATION

- a) VOC determination in the laboratory, by one or more of the afore mentioned methods in clause 7, is typically undertaken by the Client's Recognised Manufacturing Unit (RMU) Agency for Conformity Evaluation (ACE). Refer to APAS document AP-D114 for further information.
- b) Where the RMU does not have the capability to perform such determination, an alternative ACE must be chosen.
- c) The following NATA Accredited ACEs can perform all three laboratory determined methods (clause 7.2, 7.3 and 7.4):

SGS Australia Pty Ltd  
Contact: Dr Chris McRae / Dr Paul Pui  
Phone: +61 2 8594 0400 or  
+61 403 896 417 / +61 413 621 078  
Email: [Christopher.McRae@sgs.com](mailto:Christopher.McRae@sgs.com) or  
[Paul.pui@sgs.com](mailto:Paul.pui@sgs.com)  
Delivery Address: SGS Australia Pty Ltd  
Unit 16, 33 Maddox Street  
Alexandria NSW 2015

CETEC Pty Ltd  
Contact: Dr Tuan Duong  
Phone: +61 3 9544 9111 or +61 437 577 096  
Email: [Tuan.Duong@cetec.com.au](mailto:Tuan.Duong@cetec.com.au)  
Delivery Address: CETEC Pty Ltd,  
Unit 2/27 Normanby Road,  
Notting Hill VIC 3168

- d) The following CSIRO Recognised Competent Laboratory (CRCL) can perform laboratory determined method 2 (clause 7.2):

Department of Infrastructure and Transport  
Photometrics Laboratory  
Contact: George Spartalis  
Phone: +61 8 8260 0578 or +61 402 906 061  
Email: [george.spartalis@sa.gov.au](mailto:george.spartalis@sa.gov.au)  
Delivery Address:  
Department for Infrastructure and  
Transport – South Australia  
Photometrics Lab  
19 Bridge Road, Walkley Heights SA 5098

### 9 REPORTING OF RESULTS

- a) For initial product certification applications or full re-submissions, notification of the VOC content, regardless of the specification a product is applying for certification against, shall be reported on APAS document AP-D182.
- b) For minor re-submissions, where there has been no significant change to the formulation, notification of the VOC content shall be reported on APAS document AP-D139.

### 10 ARCHITECTURAL AND DECORATIVE COATINGS

- a) Appendix A, Table 1 of this document lists the APAS specifications for Architectural and Decorative coatings where a VOC limit applies.
- b) In order to allow greater formulating flexibility, where organisations that manufacture architectural and decorative coatings of the type(s) noted in Table 1 have a number of products (e.g., tinting bases) certified to the one APAS specification, APAS allows the use of average **and** maximum VOC limits. This allows formulators greater flexibility in formulating products that require higher VOC content to make them easier to apply. These paints (typically deep and ultra-deep style tint bases) are significantly lower in sales volume compared to whites and light tint bases and so have less of an impact on the environment.
- c) Where an organisation has more than one Architectural or Decorative product certified against an APAS specification listed in Appendix A, Table 1 within the one submission / resubmission, the average VOC shall be calculated. The calculated average VOC shall not exceed the average VOC limit noted in this document.
- d) Products deemed as split fills / re-labelled / child products shall not be included in the calculation; only master/parent formulations.
- e) In addition, no single product shall have a VOC content greater than the maximum VOC limit noted in this document.

### 11 LIGHT INDUSTRIAL, PAVEMENT MARKING, BUILDING INTERIOR FLOORING AND PROTECTIVE COATINGS

- a) Appendix A, Table 2 of this document lists the APAS specifications for Light Industrial, Pavement Marking, Building Interior Flooring and Protective Coatings where a VOC limit applies.
- b) The bulk of these coating types are still organic solvent based and hence, have very high VOC content. Although there have been some successful transitions to waterborne formulations without any reduction in protective properties, many formulations remain organic solvent based.
- c) Some types of Protective Coatings, such as those applied in aerospace, flat board, can and coil and large appliance coatings, are used primarily in large industrial facilities where VOC emissions are regulated under license requiring VOC reduction measurements as standard.
- d) Other types of Protective Coatings, such as those applied to steel and concrete structures in marine, anti-corrosive and protective categories, are highly specialised and infrequently applied due to their nature, such as on bridges, buildings, heavy industrial plants etc and constitute a smaller overall percentage of VOC contribution.
- e) There is little advantage for the environment if the VOC content of an organic solventborne paint is significantly reduced as the qualities imparted in a higher solvent content are lost and there is an increased need to re-apply more frequently because of this. Organic solventborne very high VOC products have not been

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included for this reason, as was previously seen in earlier versions of this document.

- f) As technology permits the introduction of waterborne, organic solvent-free or high-solids products with acceptable performance properties onto the market, protective coatings products will be reinstated to this document.
- g) Organisations making an initial product submission or re-submission for APAS certification must report VOC content.

### 12 CHANGES TO FORMULATIONS

- a) Where minor formulation changes are made to APAS certified products to conform to VOC limits, full re-submission will not be required.
- b) Should major formulation changes be required to formulations in order to conform to the VOC limit requirement, a full re-submission will be required. Refer to APAS documents AP-D183 and AP-D192 for further information.
- c) It is necessary to provide full test results relevant to those properties which could be expected to be altered by the formulation change. For example, for the reduction of a coalescing agent in an architectural waterborne paint, test results demonstrating conformance to application properties, coalescence, mudcracking and washability requirements, would typically suffice.

### 13 NEW APAS SPECIFICATIONS

- a) APAS will progressively introduce new specifications to accommodate the development of new VOC replacement technology.
- b) One aspect of this approach is that waterborne technologies may be introduced that contain higher VOC levels than traditional waterborne products but are lower in VOCs than the organic solventborne products they are designed to replace.

### 14 FAILURE TO ACHIEVE VOC TARGETS

- a) Where new limits have been applied through this revision of the document, RMUs will be given until the end of **2022** to ensure their product(s) comply to the new limits.
- b) Products not complying after this grace period has ended shall have their certification withdrawn.

### 15 COMPLAINTS AND APPEALS

- a) APAS recognised Clients may lodge a complaint or an appeal against a decision made by the APAS Certification Body, Certification Scheme, Scheme Owner or any of its processes or personnel.
- b) Appeals and complaints shall subject to the process detailed in APAS document AP-D004.

### 16 GUIDE FOR THE DETERMINATION OF VERY LOW VOC CLASSIFICATION

**NOTE:** This is a guide **only** – actual determination of VOC content must be undertaken in one or more of the methods detailed in clause 7.

- a) In order to determine if a surface coating material shall be considered to have a Very Low classification, the following variation of ISO 3251, can be used to determine the percentage (%) weight loss.
- b) To an accuracy of 1 mg, weigh approximately 10 g of a mixed coating material in delivery form ( $m_0$ ) into a flat-bottomed dish of metal or glass ( $75 \pm 5$  mm diameter, 12 mm height of rim).
- c) Spread the mixed coating material out evenly in the dish.
- d) Transfer the sample to a storage area with environmental conditions of  $23^\circ\text{C} \pm 1^\circ\text{C}$  and  $50\% \pm 2\%$  humidity. Store the sample for a 24-hour period.
- e) Remove sample from initial storage area and transfer to a secondary storage area with environmental conditions of  $80^\circ\text{C} \pm 2^\circ\text{C}$ . Store for a further 24-hour period.
- f) Weigh the mass ( $m_1$ ) of the sample after it has cooled to room temperature.
- g) Determine the percentage weight loss according to the following formula:  
$$\text{Loss of Weight (\%)} = \frac{m_0 - m_1}{m_0} \times 100$$
- h) This assessment must be carried out as a triple determination and the average result attained be used as the resultant % weight loss.
- i) The compliance and testing of Very Low determination is the responsibility of the Client and must be determined in accordance with this clause and APAS document AP-D114.



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### APPENDIX A

**Table 1: Architectural and Decorative Coating Products VOC Limits**

APAS Specification	Product Type	VOC Limit (g/L)	
		Average	Maximum
0111	Timber Coloured Spirit Stain - Low VOC Timber Coloured Spirit Stain - Standard		75 130
0114	Clear Timber Finish - One Pack Interior - Low VOC Clear Timber Finish - One Pack Interior - Standard		75 130
0134	Latex Primer for Galvanised Steel and Zincolume®		20
0172	Interior Latex Sealer (Buildings)		30
0183	Latex Wood Primer (Buildings)		30
0215/1	Interior Latex Paint, Low Odour, Low VOC - Gloss finish		<5
0215/2	Interior Latex Paint, Low Odour, Low VOC - Semi-gloss finish		<5
0215/3	Interior Latex Paint, Low Odour, Low VOC - Low gloss finish		<5
0215/4	Interior Latex Paint, Low Odour, Low VOC - Washable flat finish		<5
0215/5	Interior Latex Paint, Low Odour, Low VOC - Ceiling flat finish		<5
0215/6	Interior Latex Paint, Low Odour, Low VOC - Sealer undercoat		<5
0260/1	Interior Water Based Paint for Buildings - Gloss finish	≤60	70
0260/2	Interior Water Based Paint for Buildings - Semi-gloss finish	≤60	70
0260/3	Interior Water Based Paint for Buildings - Low gloss finish	≤40	60
0260/4	Interior Water Based Paint for Buildings - Washable flat finish	≤45	60
0260/5	Interior Water Based Paint for Buildings - Flat finish for ceilings	≤40	50
0280/1	Exterior Water Based Paint for Buildings - Gloss finish	≤55	60
0280/2	Exterior Water Based Paint for Buildings - Semi-gloss finish	≤55	60
0280/3	Exterior Water Based Paint for Buildings - Low gloss finish	≤40	45
0280/4	Exterior Water Based Paint for Buildings - Heavily pigmented gloss DTS <sup>1</sup> finish	≤50	70
0280/5	Exterior Water Based Paint for Buildings - Heavily Pigmented low gloss DTS <sup>1</sup> finish	≤45	55

**NOTE:** <sup>1</sup> DTS = direct to substrate

**Table 2: Light Industrial, Pavement Marking, Building Interior Flooring and Protective Coating Products VOC Limits**

APAS Specification	Product Type	VOC Limit (g/L)
0012	Water Based Roof Paint	100
0041/3	Pavement Marking Material - Cold Applied Plastic	< 5
0041/5	Pavement Marking Material - Water-borne Paint	60
0055	One Pack Exterior Varnish - Low VOC One Pack Exterior Varnish - Standard	75 130
0209/1L and 0209/2L	Floor Coatings for Building Interiors - Low surface emitting products	600 <sup>2</sup>
2974	Medium Build Solventless Two-Pack Epoxy Coating (to 400µm)	120
2977	Slow Drying / High Volume Solids Two-Pack Epoxy Mastic Coating (>400 µm)	180

**NOTE:** <sup>2</sup> TVOC limit expressed as µg/m<sup>2</sup>/hr after 14 days



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### APPENDIX B

#### Document History

Status: Current  
Version: 16  
Date Published: 12-09-2022

Document Version No.:	Date Published:	Summary of Changes:
16	12-09-2022	<ul style="list-style-type: none"><li>Inclusion of sub-class 0215/6 within Appendix A, Table 1 in line with specification 0215</li><li>Clause 5 renamed Background (from Introduction) and clause 6 renamed Introduction (from Background)</li><li>Minor Formatting and grammatical changes</li></ul>
15	23-6-2021	<ul style="list-style-type: none"><li>Updated clause 4 b) to include link to APAS website for specifications</li><li>Updated clause 8 to reflect testing capacity of Department of Infrastructure and Transport, Photometrics Laboratory as advised they are now unable to test to Method 3 (clause 7.3)</li><li>General format changes</li></ul>
14	09-06-2021	<ul style="list-style-type: none"><li>Updated APAS website information</li><li>Update clause 1 Scope</li><li>Updated clause 8 d) name change from DPTI to Department for Infrastructure and Transport – South Australia</li></ul>
13	05-03-2021	<ul style="list-style-type: none"><li>Addition of:<ol style="list-style-type: none"><li>Clause 8 Accredited Agencies for Conformity Evaluation</li><li>ACE and RMU definitions to clause 2.1 and acronyms ACE, CRCL, NATA and RMU to clause 2.2</li><li>AP-D114 to clause 4 b)</li></ol></li></ul>
12	22-12-2020	<ul style="list-style-type: none"><li>Addition of Appendix B Document History and removal of the Editorial Note previously used in document versions</li><li>Document brought in line with requirements of AS/NZS ISO/IEC 17065</li><li>Updated document to the current format</li><li>Incorporation of definitions and acronyms</li><li>Updated applicable document references and website details</li><li>Inclusion of clause 15 Guide for the Determination of Very Low VOC Classification</li><li>Update clause 7 for inclusion of Method 3 and Method 4 VOC determination</li><li>Updated VOC limits (clause 16, Appendix A): inclusion of limits for APAS specifications 0111, 0114, 0041/3, 0055, 0209/1L and 0209/2L; reduction in limits for 0172, 0183, 0280/1, 0280/2, 0280/3</li><li>Addition of "People + Product = Protection" to Footer</li></ul>
11	26-10-2017	<ul style="list-style-type: none"><li>Updated document to include new APAS logo</li><li>General editorial changes however there were no changes to: the VOC definition, the VOC levels, the determination of VOC content or VOC limits</li></ul>
10	05-02-2015	<ul style="list-style-type: none"><li>Updated to reflect new VOC limits for the period 2015-2019</li></ul>
9	08-12-2006	<ul style="list-style-type: none"><li>Amended the limits for specification 0260/2 from average of 60 to 65g/L in Table 1 and added <math>\leq</math> to all Average figures</li></ul>
8	26-09-2006	<ul style="list-style-type: none"><li>Listed final agreed limits for the 2007 round of VOC reductions and explains future reduction mechanisms</li></ul>
7	26-08-2002	<ul style="list-style-type: none"><li>Listed revised limits for a range of architectural coatings and detailed a new way of specifying the limits</li></ul>
6	31-05-2002	<ul style="list-style-type: none"><li>Listed revised limits for a range of architectural coatings and detailed a new way of specifying the limits</li></ul>
5	20-04-2001	<ul style="list-style-type: none"><li>Altered limits apply to some categories as indicated on each of the relevant tables</li><li>Corrected footer error</li></ul>
4	28-03-2000	<ul style="list-style-type: none"><li>Altered limits apply to some categories as indicated on each of the relevant tables</li><li>First issue to new format</li></ul>