

COATING SYSTEMS FOR NON-FERROUS METALS (ZINC AND ALUMINIUM)

1 SCOPE

Coating systems for application to zinc and aluminium substrates on which optimum surface preparation can be achieved. The systems are intended to provide a service life in excess of 10 years under corrosive or aggressive exterior environmental conditions or in situations where frequent maintenance is impractical.

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) Coating systems for application to zinc and aluminium substrates on which optimum surface preparation can be achieved. The systems are intended to provide a service life in excess of 10 years under corrosive or aggressive exterior environmental conditions or in situations where frequent maintenance is impractical.
- b) The manufacturer's product data sheet (PDS) or technical data sheet (TDS) should confirm that the exposure conditions to which the coating system is to be exposed is within the capabilities of that system.

3.2 Sub-Classes

- a) This specification incorporates the following sub-classes:
 - i. **0145/1**: Coating system for zinc and zinc alloys for atmospheric exposure
 - ii. **0145/2**: Coating system for aluminium for atmospheric exposure

3.3 Basis of this Specification

- a) This specification is not based on any specific standard or specification. Several standards in the AS/NZS 3750 series would comply with the performance requirements.
- b) A number of Australian Standards are now available which cover the basic requirements of most of the product types expected to be approved under this specification. Refer to Table D1 of AS/NZS 2312.

4 REFERENCED DOCUMENTS

- a) The following standards are referenced in this document:
 - i. **AS/NZS 1580** – Paints and related materials: Methods of test
 - ii. **AS/NZS2312** – Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings
 - iii. **AS/NZS 3750** – Paints for steel structures

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

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

- iv. **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 web site at:

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

- b) The following APAS documents are referenced in this document:
 - i. AP-D001 Rules Governing How APAS® Operates
 - ii. AP-D123 Restrictions on Ingredients in Product Formulations
 - iii. AP-D152 APAS® Participating Manufacturers and Resellers
 - iv. AP-D177 Rules Governing How Product Manufacturers participate in APAS®
 - v. AP-D181 Volatile Organic Compounds (VOC) Limits
 - vi. AP-D192 Rules Governing APAS® Product Certification Scheme

All APAS documents are available for download from the APAS website: <https://vs.csiro.au/apas/documents/>

5 COMPOSITIONAL REQUIREMENTS

5.1 Binder

- a) The binder composition is not restricted and shall be chosen to impart the properties detailed in clause 7, Table 1 below.

5.2 Volatiles

- a) Although the volatile portion shall mainly be comprised of hydrocarbons, waterborne products are not excluded by this specification.
- b) For VOC content restrictions, refer to APAS document AP-D181.

5.3 Pigmentation

- a) Products shall consist of appropriate colouring pigments chosen to impart the properties detailed in clause 7, Table 1 below.



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5.4 Colour

- a) Finishing coats approved to this specification will be approved in the colour listed.
- b) Where the decorative properties of these coatings are considered important, it is crucial that the appearance of the coating be maintained essentially throughout the life of the coating, i.e., for at least ten years. Therefore, before other colours are used, purchasers should obtain the manufacturer's written assurance that the selected colour will have acceptable colour stability for the intended purpose.

6 PRODUCT APPROVAL REQUIREMENTS

6.1 General Requirements

- a) The product and its application for approval shall comply with the relevant requirements of APAS document AP-D192 during the life of the approval.

6.2 Technical Requirements

- a) The product shall comply with **all** the requirements of clause 7, Table 1 below.
- b) The coating system will be applied to galvanised and aluminium sections according to one or more of the manufacturer's suggested instructions. The applied coatings shall comply with the appropriate preparation, application and finish requirements.
- c) Test specimens shall generally be 305 mm x 150 mm x 3mm plate.
- d) The manufacturer's own quality control schedule of tests and limits shall be allowed subject to the approval of the Executive Officer (EO), APAS.
- e) On request, the EO may request the results of the tests for a batch and compare these with previous batches.
- f) Density and non-volatile content by weight (NVCW) figures for each production batch of the approved product shall be within $\pm 3\%$ of the actual (not theoretical) figures quoted in the original product approval submission (APAS document AP-D139).
- g) Subject to compliance with all the requirements of this specification, the level of Approval appropriate to the application shall be given to the system.

6.3 Health and Safety Requirements

- a) The manufacturer's Safety Data Sheet (SDS) must be studied closely prior to using the product and complied with during use of the product.
- b) Due to the solvents contained by some of these paints, such paints are flammable and should be stored away from all sources of heat or ignition.
- c) 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. Care should be taken to avoid contact with the skin by the use of protective clothing and barrier cream. All pumping equipment should be adequately earthed.

- d) A full-face air fed respirator should be used when spraying. It is anticipated that most of these products would be applied by operators in well ventilated spray booths or in the field by operators with adequate safety equipment.
- e) 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.
- f) The product shall comply with all requirements of clause 6.3 and 6.4 of APAS document AP-D192.



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7 TABLE 1: PERFORMANCE PROPERTIES

| TEST | AS/NZS 1580 METHOD | REQUIREMENTS | | | | | | | | | | |
|---|---|---|----------|---|----------|---|------------|---|-------------------|---|-----------|---|
| Preliminary Examination | 103.1 | To be readily reincorporated. Shall be free of coarse particles, gel and foreign matter. | | | | | | | | | | |
| Thinning or Mixing Properties | 208.1 | Using the manufacturers recommended maximum amount of thinners which shall not exceed 10% by volume, there shall be no signs of incompatibility. | | | | | | | | | | |
| Viscosity | 214.X | To be recorded. | | | | | | | | | | |
| Application Properties - Brushing - Rolling - Spraying | 205.1 205.3 205.2 or 205.4 | Shall show satisfactory application properties and the dry film shall be free of defects. | | | | | | | | | | |
| Surface Dry Condition | 401.1 | To be recorded. | | | | | | | | | | |
| Hard Dry Condition (Mechanical Thumb Test) | 401.6 | To be recorded. | | | | | | | | | | |
| Colour - Visual Comparison | 601.1 | To be an approximate match. | | | | | | | | | | |
| Specular Gloss (60°) | 602.2 | To be recorded. | | | | | | | | | | |
| Finish | 603.1 | Shall be free of coarse particles, wrinkling or orange peel and have a uniform colour and appearance. | | | | | | | | | | |
| Reincorporation after Storage Degree of Settling | 211.2 211.1 | To comply with all the preceding requirements after 12 months storage at ambient temperature. Settling shall not fall below 6. In addition, the use of spray application after storage shall produce a uniform finish typical of the product type. | | | | | | | | | | |
| Resistance to Weathering | 457.1 (Cat 1) 481.1.7 481.1.8 481.1.9 481.1.10 481.3 | After 72 months exposure at all three exterior atmospheric exposure sites listed in APAS document AP-D192 clause 12 c), the coating shall show no integrity failure i.e., at the end of 6 years, the ratings shall be: <table style="width: 100%; border: none;"> <tr> <td style="width: 80%;">Checking</td> <td style="text-align: right;">0</td> </tr> <tr> <td>Cracking</td> <td style="text-align: right;">0</td> </tr> <tr> <td>Blistering</td> <td style="text-align: right;">0</td> </tr> <tr> <td>Flaking & peeling</td> <td style="text-align: right;">0</td> </tr> <tr> <td>Corrosion</td> <td style="text-align: right;">0</td> </tr> </table> Erosion: No less than 70 % of the total original film thickness shall remain and the penultimate coat shall not be exposed. | Checking | 0 | Cracking | 0 | Blistering | 0 | Flaking & peeling | 0 | Corrosion | 0 |
| Checking | 0 | | | | | | | | | | | |
| Cracking | 0 | | | | | | | | | | | |
| Blistering | 0 | | | | | | | | | | | |
| Flaking & peeling | 0 | | | | | | | | | | | |
| Corrosion | 0 | | | | | | | | | | | |
| VOC Content | APAS AP-D181 | Refer to APAS document AP-D181 for method and limits. If the APAS specification is not listed on AP-D181, a declaration of VOC content is still required . | | | | | | | | | | |



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8 APPENDIX A

Document History

Status: Current
Version: 10
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| Document Version No.: | Date Published: | Summary of Changes: |
|-----------------------|-----------------|---|
| 10 | 27-08-2021 | <ul style="list-style-type: none">• General format change to clause 1 and 3.1• Updated background information in clause 2• Updated SUSMP information• Updated APAS website information |
| 9 | 16-11-2020 | <ul style="list-style-type: none">• Addition of Appendix A Document History and removal of the Editorial Note previously used in specification versions• Updated document to the current format• Updated internal and external document references• Inclusion of VOC Content requirement to Table 1 Performance Properties• Addition of "People + Product = Protection" to Footer |
| 8 | 12-11-2003 | <ul style="list-style-type: none">• Deleted reference to GPC numbering and incorporated a general format update |
| 7 | 23-02-2001 | <ul style="list-style-type: none">• Initiated the second stage of the move to new specification numbering with prominence given to the new number (previously GPC-C-145) |