



MIO OR ALUMINIUM COATING FOR THE PROTECTION OF STEEL SUBJECT TO CONTINUOUS CONDENSATION

1 SCOPE

This specification applies to coating systems pigmented with micaceous iron oxide (MIO) or aluminium for application to steel structures in the water industry that are subject to continuous condensation conditions, such as the exterior of pipelines and tanks, on which optimum surface preparation can be achieved.

2 BACKGROUND

- To obtain a broad overview of the Australian Paint Approval Scheme (APAS), refer to APAS document AP-D001.
- To obtain an overview of restricted ingredients in APAS certified products, refer to APAS document AP-D123.
- To obtain the current list of APAS participating manufacturers (and suppliers) and resellers, refer to APAS document AP-D152.
- To obtain an overview of how to participate in the APAS, refer to APAS document AP-D177.
- 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

- This specification applies to coating systems pigmented with micaceous iron oxide (MIO) or aluminium for application to steel structures in the water industry that are subject to continuous condensation conditions, such as the exterior of pipelines and tanks, on which optimum surface preparation can be achieved.
- The systems are intended to provide a service life in excess of 10 years under Category C3 (Medium) atmospheric corrosivity conditions (refer system ALK6 in Table 6.3 of AS 2312.1) or in situations where frequent maintenance is impractical.
- Where surface preparation is likely to be marginal and surface tolerant coatings are required, reference should be made to APAS specification AP-S0156.

3.2 Sub-Classes

- This specification does not incorporate any subclass.

3.3 Basis of this Specification

- This specification is based on AS/NZS 3750.12, with the following modifications:
 - Increase in exterior durability requirements from 48 to 72 months
 - Addition of a water resistance test
- Paints approved under this specification are referenced as Paint Reference Number (PRN) C17 of AS 2312.1.
- This specification developed as the result of problems with resistance to mould and lichen growth experienced on water pipelines coated with paints complying with APAS specification AP-S2910.

4 REFERENCED DOCUMENTS

- The following standards are referenced in this document:
 - AS/NZS 1580** – Paints and related materials: Methods of test
 - AS 2312.1** – Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings – Part 1: Paint Coatings
 - AS/NZS 3750.12** – Paints for steel structures – Part 12: Alkyd/micaceous iron oxide

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

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

- 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>

- The following APAS documents are referenced in this document:
 - AP-D001 Rules Governing How APAS® Operates
 - AP-D123 Restrictions on Ingredients in Product Formulations
 - AP-D152 APAS® Participating Manufacturers and Resellers
 - AP-D177 Rules Governing How Product Manufacturers participate in APAS®
 - AP-D181 Volatile Organic Compounds (VOC) Limits
 - AP-D192 Rules Governing APAS® Product Certification Scheme
 - AP-S0156 Epoxy Mastic High Build Two-Pack Coating for Rusted Steel
 - AP-S2910 MIO or Aluminium Pigmented Coating for the Protection of Steel

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

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

5 COMPOSITIONAL REQUIREMENTS

5.1 Binder

- The binder shall typically be comprised of a single pack phenolic modified alkyd with a gloss level to facilitate the removal of dirt, mould and lichens that may grow on the surface in the moist conditions associated with these structures.

5.2 Volatiles

- The volatile portion shall be typically be comprised of hydrocarbons.



MIO OR ALUMINIUM COATING FOR THE PROTECTION OF STEEL SUBJECT TO CONTINUOUS CONDENSATION

- b) For VOC content restrictions, refer to APAS document AP-D181.

5.3 Pigmentation

- a) The pigmentation shall be chosen to impart the properties detailed in clause 7, Table 1 below.

5.4 Colour

- a) Products approved under this specification are normally only available in a limited range of colours.
- b) It is not expected that the decorative properties of these coatings are considered important. If it is crucial that the appearance of the coating be maintained essentially throughout the life of the coating the purchaser 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.

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) As products covered by this specification principally contain solvents, the paint is considered 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.
- d) Care should be taken to avoid contact with the skin using protective clothing and barrier cream. All pumping equipment should be adequately earthed. 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.



SPECIFICATION AP-S2940



MIO OR ALUMINIUM COATING FOR THE PROTECTION OF STEEL SUBJECT TO CONTINUOUS CONDENSATION

7 TABLE 1: PERFORMANCE PROPERTIES

TEST	AS/NZS 1580 METHOD	REQUIREMENTS
General Requirements	AS/NZS 3750.12	Shall comply with all the requirements of clause 2 Material Requirements . All results shall be reported. NOTE: Any duplicated tests listed below take precedence; other tests listed below are in addition to these requirements.
Wet Paint Tests		
Thinning or Mixing Properties	208.1	Using 10% of manufacturers recommended thinner, there shall be no signs of incompatibility.
Viscosity	214.x	State method and record results.
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.
Aged Application Properties - Brushing - Rolling - Spraying	205.1 205.3 205.2 or 205.4	A sample of the paint that has been stored for 12 months at ambient conditions shall show satisfactory application properties and the dry film shall be free of defects.
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 .
Dry Film Tests		
Hard Dry Condition (Mechanical Thumb Test)	401.6	Not greater than 16 hours.
Specular Gloss (60°)	602.2	Greater than 10%.
Resistance to Water at Room Temperature	455.1 403.1	No blistering, wrinkling, gloss loss, colour change or other film defects after 24 hours immersion in water at 25 ± 3° C. Scratch resistance shall not be less than 1000g.



SPECIFICATION AP-S2940



MIO OR ALUMINIUM COATING FOR THE PROTECTION OF STEEL SUBJECT TO CONTINUOUS CONDENSATION

TEST	AS/NZS 1580 METHOD	REQUIREMENTS
Dry Film Tests (Cont.,)		
Resistance to Natural Weathering	AS/NZS 3750.12 clause 2.6.6	After 72 months exposure at all 3 exterior atmospheric exposure sites (listed in APAS document AP-D192, clause 12), the coating shall show no integrity failure i.e., at the end of 6 years, the ratings shall be:
	457.1 (Cat 1)	
	481.1.7	Checking 0
	481.1.8	Cracking 0
	481.1.9	Blistering 0
	481.1.10	Flaking and Peeling 0
481.3	Corrosion 0	



SPECIFICATION AP-S2940



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8 APPENDIX A

Document History

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Document Version No.:	Date Published:	Summary of Changes:
3	02-09-2021	<ul style="list-style-type: none">• General format changes• Updated background information in clause 2• Updated SUSMP information• Updated APAS website information
2	22-12-2020	<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
1	18-11-2003	<ul style="list-style-type: none">• Incorporated a general format update and editorial changes
0	05-05-2003	<ul style="list-style-type: none">• Original document