

MEDIUM BUILD TWO-PACK EPOXY COATING FOR THE LONG-TERM PROTECTION OF STEEL

1 SCOPE

This specification applies to catalysed epoxy coating systems with total dry film builds up to approximately 400µm, for application to steel structures on which optimum surface preparation can be achieved.

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) This specification applies to catalysed epoxy coating systems with total dry film builds up to approximately 400µm, for application to steel structures on which optimum surface preparation can be achieved.
- b) The systems are intended to provide a service life in excess of 15 years under Category C3 (Medium) atmospheric corrosivity conditions (refer AS 2312.1) or in situations where frequent maintenance is impractical.
- c) Systems approved under this specification, while generally approved for atmospheric exposure, may also have the following approvals: fresh water immersion, salt water immersion, potable water immersion and tank lining for hydrocarbon fuels.
- d) Where surface preparation is likely to be marginal and surface tolerant coatings may be required, reference should be made to APAS specification AP-S0156 or AP-S2977.

3.2 Sub-Classes

- a) This specification incorporates the following subclasses:
 - i. **2973**: For atmospheric exposure
 - ii. **2973F**: For fresh water immersion
 - iii. **2973P**: For potable water immersion
 - iv. **2973S**: For salt water immersion
 - v. **2973T**: Tank lining for hydrocarbon fuels
- b) Where the product is required for use as a tank lining for substances other than hydrocarbon fuels, specific advice on chemical resistance must be obtained from the coating manufacturer.

3.3 Basis of this Specification

- a) This specification is based on AS/NZS 3750.14, with the following modification:
 - i. Increase in exterior durability requirements from 48 to 72 months
- b) Paints approved under this specification are referenced as Paint Reference Number (PRN) C13 and C13a of AS 2312.1.

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 2312.1** – Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings – Part 1: Paint Coatings
 - iii. **AS/NZS 3750.10** – Paints for steel structures – Part 10: Full gloss epoxy (two-pack)
 - iv. **AS/NZS 3750.14** – Paints for steel structures – Part 14: High-build epoxy (two-pack)
 - v. **AS/NZS 4020** – Testing of products for use in contact with drinking water
 - vi. **AS ISO/IEC 17025** - General requirements for the competence of testing and calibration laboratories

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

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

- vii. **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
 - vii. AP-S0156 Epoxy Mastic High Build Two-Pack Coating for Rusted Steel
 - viii. AP-S2977 Slow Drying / High Volume Solids Two-Pack Epoxy Mastic Coating for the Long-term Protection of Steel



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

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5 COMPOSITIONAL REQUIREMENTS

5.1 Binder

- a) Typically, the binder will be a catalysed epoxy binder with polyamide, amine adduct or other hardeners.

5.2 Volatiles

- a) The volatile portion shall be typically comprised of hydrocarbons.
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 8, Table 1 below.

5.4 Colour

- a) Products approved under this specification are normally only available in a limited range of colours.
b) The early chalking and loss of gloss characteristic of epoxies on exterior exposure may detract from the decorative properties but not from the protective properties of the product.

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 8, 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.



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7 APPENDIX A

Guidelines for Approval of Coating Systems for Use in Potable Water

- 7.1 APAS requires that all products intended for use in contact with potable water shall be approved for such an end use by an appropriate authority.
- 7.2 Such approval is indicated by having a suffix **P** after the specification number e.g. AP-S2973P. The issued certificate of product approval will clearly identify the appropriate exposure condition.
- 7.3 In order to gain product approval, the appropriate evidence of suitability needs to be supplied:
- An AS ISO/IEC 17025 endorsed test report (NATA in Australia) from an approved authority indicating compliance with AS/NZS 4020 **Products for use in contact with drinking water**, refer below for approved testing authority, or
 - Details of a technical case history of at least 6 years duration indicating satisfactory performance in contact with drinking water. A letter from the asset owner shall be supplied stating:
 - The name of the product used, and
 - The nature of its use in a potable water application, and
 - The period during which it has been in continuous use, and
 - How well it has been performing
- 7.4 In Australia, the APAS recognised testing laboratory for AS/NZS 4020 is:

Australian Water Quality Centre (AWQC) –
Business Unit of the South Australian Water
Corporation (SA Water)
NATA Accreditation No. 1115

250 Victoria Square
ADELAIDE, South Australia, 5000

Direct Lab Number: (08) 7424 1512
General Enquiries: producttesting@awqc.com.au

Direct Contacts:
Michael Glasson (Supervisor Product Testing)
Email: michael.glasson@awqc.com.au

Peter Christopoulos (Senior Technical Officer –
Product Testing)
Email: peter.christopoulos@awqc.com.au

- 7.5 Following any changes to the ingredients of the formulation or to the source of raw materials, the product shall be retested to confirm continued compliance with the Standard. The new certificate of compliance shall form part of the re-submission to APAS as required by APAS document AP-D192.



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8 TABLE 1: PERFORMANCE PROPERTIES

TEST	AS/NZS 1580 METHOD	REQUIREMENTS
General Requirements	AS/NZS 3750.14	<p>Shall comply with all the requirements of clause 2 Material Requirements, with the exception of clause 2.5.8 where 48 months shall be replaced by 72 months as detailed below.</p> <p>All results shall be reported.</p> <p>NOTE: Other tests listed below are in addition to these requirements.</p>
Non-volatile Content by Volume	301.2	Minimum 50%.
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 of Aged Sample	AS/NZS 3750.10	A sample of the product which has been stored at routine conditions for 12 months shall produce a uniform finish typical of the product type when applied by spray. The sprayed film shall still comply with the requirements of:
	2.5.1	Surface Dry Time: < 3 hours
	2.5.2	Hard Dry Time: < 18 hours
	2.5.3	Curing Properties: > 1.5 kg
Specular Gloss (60°)	602.2	To be recorded.
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 .
Resistance to Natural Weathering ALL Sub-classes	AS/NZS 3750.14 clause 2.5.8 457.1	After 72 months exposure at all 3 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:
	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
Resistance to Immersion - Salt and Fresh Water 2973F and 2973S only	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 1



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TEST	AS/NZS 1580 METHOD	REQUIREMENTS
Resistance to Immersion - Potable Water 2973P only	AS/NZS 4020	For potable water approval, the product shall pass the Resistance to Immersion – Fresh Water requirements detailed above. In addition, a potable water compliance certificate, as detailed in clause 7, Appendix A shall be provided.
Resistance to Immersion - Hydrocarbon Fuels 2973T only		When immersed for 2 hours at ambient temperature in a solution of 75% n-heptane and 25% toluene, the coating shall show no sign of softening, lifting, crazing or blistering.



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9 APPENDIX B

Document History

Status: Current
Version: 10
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Document Version No.:	Date Published:	Summary of Changes:
10	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
9	23-12-2020	<ul style="list-style-type: none">• Addition of Appendix B 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 (including current AWQC information)• Inclusion of VOC Content requirement to Table 1 Performance Properties• Addition of "People + Product = Protection" to Footer
8	10-12-2003	<ul style="list-style-type: none">• Removed reference to GPC and incorporated a general format update
7	12-04-2002	<ul style="list-style-type: none">• Aligned naming conventions with Australian Standards• A test for compliance with tank lining requirements was also included
6	10-04-2001	<ul style="list-style-type: none">• Initiated the second stage of the move to new specification numbering with prominence given to the new number (Old specification number: GPC-C-29/7 Type 3)