

EPOXY MASTIC HIGH BUILD TWO-PACK COATING FOR RUSTED STEEL

1 SCOPE

A two-pack, high build, high solids, epoxy coating for the atmospheric protection of structural steel, steel pipelines or similar structures where thorough surface preparation is not achievable.

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

- A two-pack, high build, high solids, epoxy coating for the atmospheric protection of structural steel, steel pipelines or similar structures where thorough surface preparation is not achievable. Also referred to as **surface tolerant epoxy**.
- For application to hand or power tool cleaned steel prepared typically to a Class 2 finish in accordance with AS 1627 Part 2 or 7. Such prepared steel may have residual rust on bare steel areas and existing sound paint of any type.
- The coating is expected to adhere well when applied over such surface preparation and shall not cause lifting or have any other adverse effect on the existing paint.
- When applied to a nominal dry film thickness of 200µm in one or two coats, the coating is expected to provide protection for the substrate for a minimum of 6 years.
- While predominantly aluminium in colour, other colours are now also available.
- For the purpose of additional protection e.g., to prevent acid or alkali attack on the aluminium pigment, or decoration or colour identification, the epoxy coating shall be capable of being top coated within 2 months of the original coating application. Only minimal cleaning to remove dirt, grease, etc. shall be required. A range of other APAS approved finishing paints nominated by the manufacturer shall be able to be used.
- If overcoating is required beyond this time, the epoxy coating will require abrading and/or solvent swabbing before top coating.
- The coating would also be suitable for single coat application to hand tool cleaned internal protected structural steel for up to 10 years.
- While airless spray is the preferred method of application for these products, conventional spray or

brush application may be employed if considered acceptable by the coating manufacturer.

- Mixed paint meeting the requirements of this specification, shall be such that the mixing ratio is 1:1, 2:1, 3:1 or other simple ratio, by volume.

3.2 Sub-Classes

- This specification incorporates the following sub-classes:
 - 0156/1:** Aluminium
 - 0156/2:** Colours

3.3 Basis of this Specification

- This specification is based on AS/NZS 3750.1 except that:
 - durability requirements have been upgraded from 24 months to 72 months, and
 - volume solids have been increased from >70% to minimum 85%
- This product type corresponds to Paint Reference Number (PRN) C32 of AS/NZS 2312.

4 REFERENCED DOCUMENTS

- The following standards are referenced in this document:
 - AS/NZS 1580** – Paints and related materials: Methods of test
 - AS 1627** – Metal finishing – Preparation and pre-treatment of surfaces
 - AS/NZS 2312** – Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings
 - AS/NZS 3750.1** – Paints for steel structures – Part 1: Epoxy mastic (two-pack) – For rusted steel

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



EPOXY MASTIC HIGH BUILD TWO-PACK COATING FOR RUSTED STEEL

- 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

- The binder shall typically comprise epoxy resin and suitable curing agent(s), surface wetting modifiers and solvent, if necessary.
- The curing agent shall consist essentially of polyamine, polyamide or amine adduct resins, with or without accelerators.

5.2 Volatiles

- The volatiles shall typically consist of hydrocarbons.
- For VOC content restrictions, refer to APAS document AP-D181.

5.3 Pigmentation

- The pigmentation shall typically consist of aluminium and/or other suitable pigments to give the desired properties in clause 9 Table 1 below.

5.4 Colour

- Colour is normally not a critical issue with these types of products. A limited colour range is usually available.

6 PRODUCT APPROVAL REQUIREMENTS

6.1 General Requirements

- 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

- The product shall comply with **all** the requirements of clause 9, Table 1 below.
- The manufacturer's own quality control schedule of tests and limits shall be allowed subject to the approval of the Executive Officer (EO), APAS.
- On request, the EO may request the results of the tests for a batch and compare these with previous batches.
- 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).
- 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

- The manufacturer's Safety Data Sheet (SDS) must be studied closely prior to using the product and complied with during use of the product.
- Since the paint contains a hydrocarbon solvent, the paint is flammable and should be stored away from all sources of heat or ignition. 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. A full-face air fed respirator should be used when spraying.
- 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.
- The product shall comply with all requirements of clause 6.3 and 6.4 of APAS document AP-D192.

EPOXY MASTIC HIGH BUILD TWO-PACK COATING FOR RUSTED STEEL

7 APPENDIX A

Procedure for Rusting Test Specimens prior to Surface Preparation and Coating Application

- 7.1 Test panels shall be abrasive blast cleaned to a class 2½ finish (AS 1627 Part 4) utilising sand or fine grit such that no distortion of the panel occurs.
- 7.2 Immediately coat one side of each panel with an inorganic zinc silicate primer complying with APAS specification AP-S2908, or other coating offering similar durability, and cure. This shall constitute the panel backing.
- 7.3 Test panels shall be sprayed once with a salt spray complying with that in AS 1580.452.2 (Salt Droplet Test) and then exposed in a fog room i.e., an environment providing continuous 100% humidity at 20 - 25°C, until an evenly rusted surface is produced e.g., Grade C of AS 1627 Part 9.

8 APPENDIX B

Procedure for Evaluating Resistance to Natural Weathering

- 8.1 The coating, when applied at a mean dry film thickness of 200µm for the durability test, shall comply with the appropriate preparation and application details provided under AS/NZS 3750.1.
- 8.2 The paint will be applied to rusted mild steel test specimens according to one or more of the manufacturer's suggested instruction, which are appropriate for the intended conditions of exposure. Alternatively, approval may be given to a product where independent verifiable performance of equivalent standard can be demonstrated (refer clause 7, Appendix 1).
- 8.3 Prior to surface preparation and coating application, the test specimens shall be rusted in accordance with clause 7, Appendix A.
- 8.4 Surface preparation shall then consist of wire brushing to Class 2 of AS 1627 Part 7. Loose particles shall be brushed off and the surface degreased in accordance with AS 1627 Part 1.
- 8.5 The product shall be tested at **each** of the following atmospheric exposure sites (refer to clause 12, APAS document AP-D192 for further information):
 - Atmospheric, Light Industrial - Clayton, Victoria
 - Atmospheric, Marine - Flinders, Victoria
 - Atmospheric, Tropical - Darwin, Northern TerritoryTest specimens are exposed in accordance with AS 1580.457.1 (Category 1).
- 8.6 Each test specimen will be examined at approximately 12 monthly intervals and after 6 years continuous exposure, the coating shall comply with the requirements of clause 9, Table 1 below.
- 8.7 Erosion of the coating shall be such that after 6 years, no less than 70% of the total original film thickness shall remain.



SPECIFICATION AP-S0156



EPOXY MASTIC HIGH BUILD TWO-PACK COATING FOR RUSTED STEEL

9 TABLE 1: PERFORMANCE PROPERTIES

| TEST | AS/NZS 1580 METHOD | REQUIREMENTS |
|--|--|--|
| General Requirements | AS/NZS 3750.1 | Shall comply with all the requirements of clause 2 Materials Requirements , except as amended below. All results shall be reported. |
| Non-volatile Content by Volume (Volume Solids) | | Minimum 85%. <ul style="list-style-type: none">Volume solids may be determined theoretically from raw material data. |
| Surface Dry Condition | 401.1 | Maximum 12 hours. |
| Thinning or Mixing Properties | 208.1 | With recommended application thinner, no separation or other signs of incompatibility for pot life period. At end of pot life, to be easily cleaned up with recommended cleaning solvent. |
| Pot Life | | A full 500mL tin of the mixed paint shall retain satisfactory application properties after 3 hours at 25 ± 1°C. |
| Adhesion | 408.2 | Steel panels complying with AS 1580.104.1 prepared in accordance with AS 1580.105.2 when painted, to have a minimum rating of 4. |
| Recoating Properties | 404.1 | Apply first coat and cure for 7 days. Apply second coat and cure for further 7 days (AS 1580.101.1). No wrinkling, lifting or other patchiness. Second coat to have adhesion classification of 0 in accordance with AS 1580.408.4. |
| Resistance to Natural Weathering | AS/NZS 3750.1 and Clause 8, Appendix B | No integrity failure after 72 months (Interim approval may be considered at 48 months). |
| VOC Content | | 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 . |



SPECIFICATION AP-S0156



EPOXY MASTIC HIGH BUILD TWO-PACK COATING FOR RUSTED STEEL

10 APPENDIX C

Document History

Status: Current
Version: 10
Date Published: 30-08-2021

| Document Version No.: | Date Published: | Summary of Changes: |
|-----------------------|-----------------|---|
| 10 | 30-08-2021 | <ul style="list-style-type: none">• General format changes• Updated background information in clause 2• Updated SUSMP information• Updated APAS website information |
| 9 | 19-11-2020 | <ul style="list-style-type: none">• Addition of Appendix C 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 | 23-09-2003 | <ul style="list-style-type: none">• Deleted reference to GPC numbering and incorporated a general format update |
| 7 | 13-09-2001 | <ul style="list-style-type: none">• Aligned naming conventions with Australian Standards |
| 6 | 06-03-2001 | <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-156) |