



## CHLORINATED RUBBER COATING FOR STEEL

### 1 SCOPE

- This specification refers to chlorinated rubber coatings for application to steel structures for use in atmospheric and marine corrosivity conditions.
- This document is prepared in a manner compliant with the requirements of AS/NZS ISO/IEC 17065.
- APAS<sup>®</sup> 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 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 DEFINITIONS AND ACRONYMS

#### 3.1 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 shall apply:

- APAS Signatory:** A person(s) authorised by APAS to exercise local control over the production, testing and application for certification. The role of the Signatory is to ensure compliance with APAS rules.
  - 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.
  - Certification Requirement:** The specified requirement(s), including product requirement(s), that is fulfilled by the Client as a condition of establishing or maintaining certification.
  - 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).
- f) **Scheme Owner:** The organisation responsible for developing and maintaining the certification scheme. CSIRO is the APAS Scheme Owner.
- g) **Secretariat:** The organisation that provides administrative support and other resources necessary to keep the Certification Scheme functioning. The Secretariat is vested in CSIRO.

#### 3.2 Acronyms

The following acronyms appear in this document:

<b>APAS</b>	Australian Paint Approval Scheme
<b>CSIRO</b>	Commonwealth Scientific and Industrial Research Organisation
<b>MIO</b>	Micaceous iron oxide
<b>SDS</b>	Safety Data Sheet
<b>SUSMP</b>	Standard for the Uniform Scheduling of Medicines and Poisons
<b>TDS</b>	Technical Data Sheet
<b>WHS</b>	Workplace Health and Safety

### 4 DESCRIPTION AND GUIDE FOR USERS

#### 4.1 General Information and Requirements

- Chlorinated rubber coatings are single component solvent based materials with high VOC levels i.e.  $\geq 500$  g/L. They form a film via the evaporation of solvents, not from cross linking of components, so are fast drying and not temperature dependant for application. Products can be applied year-round but tend to dry slower in colder weather. Currently there are no readily available water-borne or high-solid replacement options.
- Technology used in the production of these materials have been in use for over 100 years, with Australia having a multitude of case history examples.
- Chlorinated rubber coatings are hard wearing, have good chemical, moisture, water and abrasion resistance, are chemically stable and have reduced reactivity. High-build options are able to achieve 100+  $\mu\text{m}$  film thickness. They show good adhesion to substrate and between coats and have anti-fouling and mould resistant properties.
- These types of coatings are suited for application to steel work on bridges, metal tanks, chemical plants (mild acid or alkali), refineries, hoppers and steel silos, boats, wharf structures, swimming pools, manhole covers, metal or concrete posts and can also be used as road markings (refer to APAS specification AP-S0041/2).
- Chlorinated rubber coatings are deemed thermoplastic in that they soften with heat and are softer than epoxies. For this reason, they are not recommended for use in conditions above 80°C. They also tend to lose gloss and yellow over time but the addition of micaceous iron oxide pigment in the film helps to form a barrier against moisture ingress and improve resistance to degradation by UV light. They are a significantly cheaper option when compared to epoxies, so a more economical choice where budgets are concerned.

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- f) High build products tend to be harder to apply and can suffer from blisters and poor adhesion if application conditions are not correct i.e., dry surfaces, away from direct sunlight, in ambient conditions etc. Their use is not recommended if they are to come into contact with solvents and oils.
- g) Chlorinated rubber paints tend to be applied over a primer such as an inorganic zinc silicate, catalysed organic zinc rich, two-pack epoxy or an etch primer. They are used as a high-build, single or multi-coat finish, as an intermediate coating for under a chlorinated rubber topcoat or as a gloss finish coat over high-build or other intermediate coats.
- h) The manufacturer's TDS should confirm that the exposure conditions to which the coating system is to be exposed is within the capabilities of that system.
- i) Where surface preparation is likely to be marginal and surface tolerant coatings are required, reference should be made to APAS specification AP-S0156.
- v. **AS 2855** – Paints and related materials – Micaceous iron oxide
- vi. **AS/NZS 3750.11** – Paints for steel structures – Part 11: Chlorinated rubber – High-build and gloss

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 documents were utilised in the creation of this document:
- Birkenhead, T.F. (1969), *Advantages of chlorinated rubber paints*, Anti-corrosion Methods and Materials, Vol. 16 No. 10 pp. 24-26
  - Stoye, D & Freitag, W. (1998), *Paints, Coatings and Solvents*, Second Completely Revised Edition
- c) 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-S0041/2 Pavement Marking Material – Solvent-Borne Paint
  - AP-S0156 Epoxy Mastic High Build Two-Pack Coating for Rusted Steel

### 4.2 Sub-Classes

- a) This specification, in line with AS/NZS 3750.11, incorporates the following sub-classes:
- 2903/1**: High-build pigmented chlorinated rubber paint (Type 1)
  - 2903/2**: High-build chlorinated rubber paint containing  $\geq 90\%$  micaceous iron oxide (Type 2)
  - 2903/3**: Low-build pigmented chlorinated rubber paint, gloss (Type 3)

### 4.3 Basis of this Specification

- a) This specification is based on AS/NZS 3750.11 with the following modifications:
- Thinner compatibility
  - Viscosity
  - Increase in exterior durability testing from 48 to 72 months
  - VOC Content
- b) Paints approved under this specification **do not** correspond to any Paint Reference Numbers (PRN) of AS/NZS 2311 or AS 2312.1.
- c) Paints of sub-classes 2903/1 and 2903/2 correspond with 2<sup>nd</sup> and 3<sup>rd</sup> coat components of System Designation CLR3 within Table C1 of AS 2312.1.

## 5 REFERENCED DOCUMENTS

- a) The following standards are referenced in this document:
- AS/NZS 1580** – Paints and related materials: Methods of test
  - AS/NZS ISO/IEC 17065** - Conformity assessment: Requirements for bodies certifying products, processes and services
  - AS/NZS 2311** – Guide to the painting of buildings
  - AS 2312.1** – Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings – Part 1: Paint Coatings

## 6 COMPOSITIONAL REQUIREMENTS

### 6.1 Binder

- a) The binder typically consists of a natural or synthetic rubber reacted with chlorine to give nominal chlorine content of 65% by mass with  $\leq 5\%$  modifying resin.
- b) The binder is chosen to impart the properties detailed in clause 8, Table 1 below.

### 6.2 Volatiles

- a) The volatile component is typically comprised of hydrocarbon solvents.
- b) For VOC content restrictions, refer to APAS document AP-D181.

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



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### 6.3 Pigmentation

- a) The pigmentation shall be chosen to impart the properties detailed in clause 8, Table 1 below.
- b) Micaceous iron oxide (MIO) present in sub-class AP-S2903/2 paints must retain its laminar form and comply with AS 2855.

### 6.4 Colour

- a) Products approved under sub-classes AP-S2903/1 and AP-S2903/3 of this specification are normally available in a wide range of colours.
- b) Products approved under sub-class AP-S2903/2 of this specification are normally available in a limited number of colours i.e., grey.
- c) Refer to the manufacturers Product Data Sheet (PDS) or Technical Data Sheet (TDS) for the full range of colours available.
- d) 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. 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.

- 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.

## 7 PRODUCT APPROVAL REQUIREMENTS

### 7.1 General Requirements

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

### 7.2 Technical Requirements

- a) The product shall comply with **all** the requirements of clause 8, Table 1 below.
- b) Subject to compliance with all the requirements of this specification, the Level of Approval (Class I or Class II) appropriate to the application shall be given to the system.

### 7.3 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 typically contain hydrocarbon 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 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.



# SPECIFICATION AP-S2903



## CHLORINATED RUBBER COATING FOR STEEL

**8 TABLE 1: PERFORMANCE PROPERTIES**

TEST	AS/NZS 1580 METHOD	REQUIREMENTS															
General Requirements	<b>AS/NZS 3750.11</b>	<p>Shall comply with <b>all</b> the requirements of the following clauses (except as amended below):</p> <ul style="list-style-type: none"> <li>• 2.3 Test Conditions.</li> <li>• 2.4 Liquid Paint.</li> <li>• 2.5 Application Properties.</li> <li>• 2.6 Applied Film.</li> </ul> <p><b>All</b> results shall be reported.</p>															
Thinning or Mixing Properties	208.1	Using 10% of manufacturers recommended thinner, there shall be no signs of incompatibility.															
Viscosity	214.x	State AS/NZS 1580.214 test method and record results.															
Resistance to Natural Weathering	457.1 (Cat 1)	<p>After <b>72 months exposure</b> at all three 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:</p> <table border="0"> <tr> <td>481.1.7</td> <td>Checking</td> <td>0</td> </tr> <tr> <td>481.1.8</td> <td>Cracking</td> <td>0</td> </tr> <tr> <td>481.1.9</td> <td>Blistering</td> <td>0</td> </tr> <tr> <td>481.1.10</td> <td>Flaking and Peeling</td> <td>0</td> </tr> <tr> <td>481.3</td> <td>Corrosion</td> <td>0</td> </tr> </table>	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
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															
VOC Content	APAS AP-D181	<p>Refer to APAS document AP-D181 for method and limits.</p> <p>If the APAS specification is not listed on AP-D181, a declaration of VOC content <b>is still required</b>.</p>															



# SPECIFICATION AP-S2903



## CHLORINATED RUBBER COATING FOR STEEL

### 9 APPENDIX A

#### Document History

Status: Current  
Version: 11  
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Document Version No.:	Date Published:	Summary of Changes:
11	13-09-2021	<ul style="list-style-type: none"><li>General format changes</li><li>Updated background information in clause 2</li></ul>
10	21-06-2021	<ul style="list-style-type: none"><li>Updated APAS website details within document</li><li>Updated SUSMP reference to latest version</li><li>WHS acronym added to clause 3.2</li><li>General formatting changes</li></ul>
9	23-04-2021	<ul style="list-style-type: none"><li>Full technical review and update</li><li>Document brought in line with requirements of AS/NZS ISO/IEC 17065</li><li>Inclusion of clause 3 Definitions and Acronyms</li><li>Inclusion of clause 5 b) Reference material</li><li>Updated Poisons Standard Reference information</li><li>Inclusion of all three Types in line with AS/NZS 3750.11, clause 1</li><li>Hard dry time brought in line with AS/NZS 3750.11</li></ul>
8	11-12-2020	<ul style="list-style-type: none"><li>Addition of Appendix A Document History and removal of the Editorial Note previously used in specification versions</li><li>Updated document to the current format</li><li>Updated internal and external document references (classification C25 no longer part of AS/NZS 2312)</li><li>Inclusion of VOC Content requirement to Table 1 Performance Properties</li><li>Addition of "People + Product = Protection" to Footer</li></ul>
7	03-11-2003	<ul style="list-style-type: none"><li>Deleted reference to GPC numbering and incorporated a general format update</li></ul>
6	23-04-2001	<ul style="list-style-type: none"><li>Initiated the second stage of the move to new specification numbering with prominence given to the new number (previously GPC-C-29/3)</li></ul>