



## COATINGS FOR AVIATION FUEL TANK INTERNAL LINING

### 1 SCOPE

This specification applies to coatings for the interior linings of storage tanks for aircraft fuels.

### 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.
- This specification has been produced in collaboration with the Australian Government's Defence Science & Technology Group (DST).

### 3 DESCRIPTION AND GUIDE FOR USERS

#### 3.1 General Requirements

- This specification is intended for the internal lining of tanks used for storing AVTUR containing FSII, AVCAT containing FSII and AVGAS aviation fuel, including tanks which also contain water, such as may collect on walls and in sump areas.
- Finishing coats are generally white or off-white with primers or intermediate coats being available in contrasting colours to aid application.
- Intended generally for application by spray with brush or roller application only for small areas for patch repairs.
- The coating system is expected to provide protection and withstand normal service conditions for a period of not less than 10 years.
- These coatings meet Defence Department needs for the internal lining of bulk fuel storage tanks and ancillary equipment.
- Products approved under this specification are accepted on the basis that they will continue to meet this specification when newly coated tank surfaces are washed down with a detergent solution followed by clean water rinse to remove any extractable surface organics and loose particulate matter prior to filling the tanks with fuel.

#### 3.2 Sub-Classes

- This specification does not incorporate any sub-class.

#### 3.3 Basis of this Specification

- This specification is not based on any known specification or standard.

- Products approved under this specification do not comply with any Paint Reference Number (PRN) of AS/NZS 2311 and 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 1627.4** – Metal finishing – Preparation and pre-treatment of surfaces – Abrasive blast cleaning of steel
  - AS/NZS 2311** – Guide to the painting of buildings
  - AS/NZS 2312** – Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings
  - AS 2700** – Colour standards for general purposes
  - ASTM D381** – Standard Test Method for Gum Content in Fuels by Jet Evaporation
  - ASTM D3241** – Standard Test Method for Thermal Oxidation Stability of Aviation Turbine Fuels
  - IP 131** - Petroleum Products - Gum Content of Light and Middle Distillate Fuels - Jet Evaporation Method
  - IP 323** – Determination of Thermal Oxidation stability of Gas Turbine Fuels

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

- The following Defence and/or DST documents are referenced in this document:
  - DEF (AUST) 52071 - Turbine Fuel, Aviation (NATO Code F-44 AVCAT/FSII)
  - DEF (AUST) 52401 - Turbine Fuel, Aviation (NATO Code F-34 AVTUR+FSII)
  - DEFSTAN 91-901 - Gasoline, Aviation (UK (Joint Service UK Designation AVGAS 80, 100 or 100LL))
  - MIL-DTL-854701 - Inhibitor, Icing, Fuel System, High Flash (NATO Code S-1745)
  - Defence Standard 91-090: Gasoline aviation: Grades UL91, 100/130 and 100/130LL, Joint Service Designation: AVGAS 100 and AVGAS 100LL, Issue 4, dated 30 October 2015, (UK) Ministry of Defence

These documents are available through the DST website: <https://www.dst.defence.gov.au/>

**NOTE:** The latest versions of these documents **must** always be used.

## COATINGS FOR AVIATION FUEL TANK INTERNAL LINING

- 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

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 consist of epoxy or modified epoxy resin together with appropriate curing agents.
- Other binders may be considered for certification but their acceptance or otherwise will be dependent on full test results and consideration and acceptance by DST.

#### 5.2 Volatiles

- Although there is no restriction placed on the type of volatiles used, typically the volatile portion shall principally be comprised of hydrocarbons.
- The coating shall **not** contain benzyl chlorinated compounds, ethylene-based glycol ethers and their acetates.
- For VOC content restrictions, refer to APAS document AP-D181.

#### 5.3 Pigmentation

- Although there are minimal restrictions placed on the type(s) of pigment used (see 5.3 b) below), they shall be non-toxic and anti-corrosive and comply with the requirements of the SUSMP. Of primary importance is the compliance with the technical requirements detailed in clause 16, Table 1 below.
- The coating shall **not** contain metallic zinc, aluminium, copper, copper alloys, lead or chromate-based pigments.

#### 5.4 Colour

- Typically, products approved under this specification are normally available in white or an off-white colour.

### 6 PRODUCT APPROVAL REQUIREMENTS

#### 6.1 General Requirements

- The product and its application shall comply, during the application process and the life of the approval, with all requirements of APAS document AP-D192.

#### 6.2 Technical Requirements

- The product shall comply with **all** the requirements of clause 16, Table 1 below.
- Environmental conditions for application, curing and testing of these products are to be in accordance with AS 1580.101.5.
- Test panels shall be either of the following as appropriate:
  - Tin plate panels shall be of minimum 0.3 mm thickness and maximum of 100 x 75mm in accordance with AS 1580.104.1. Prior to coating application, the panels are to be abraded and cleaned in accordance with AS 1580.105.2.
  - Steel panels shall be of minimum 1.2 mm thickness and maximum of 100 x 75mm in accordance with AS 1580.104.1 (some tests have specific thickness requirements). Prior to coating application, panels are to be abrasive blast cleaned to Class 2.5 of AS 1627.4.
- Other dimensions of the test panels shall be appropriate for the method.
- Each product shall be applied to the relevant test panels in accordance with the manufacturer's recommendations and film thickness, as detailed on the manufacturer's product data sheet (unless otherwise stated).

#### 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.
- 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.

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### 7 APPENDIX A

#### Determination of Pot Life

- 7.1 **Scope:** The pot life of each two-pack product in the coating system shall be confirmed using the following procedure.
- 7.2 **Equipment:**
- 7.2.1 Roto-thinner or Brookfield rotational viscometer
- 7.3 **Procedure:**
- 7.3.1 Condition the components of each product until their temperatures have been stabilised at  $25 \pm 1^\circ\text{C}$ .
- 7.3.2 Thoroughly mix the components in the ratio specified by the manufacturer to give a sample of 500 mL volume and allow to stand for 10 minutes.
- 7.3.3 Determine the consistency using a Roto-thinner or Brookfield viscometer in accordance with AS 1580.214.4 or 214.5 respectively as recommended by the manufacturer.
- 7.3.4 Allow the mixed sample to stand for a period of at least 1.5 hours or for the manufacturer's recommended pot life time, whichever is greater, at  $25 \pm 1^\circ\text{C}$  and again determine consistency.
- 7.4 **Results and Assessment:** The consistency at the end of the standing period in 7.3.4 shall not differ from the original value by more than 15% percent.

### 8 APPENDIX B

#### Determination of Cure Time

- 8.1 **Scope:** This method details how the curing time of the mixed coating shall be determined.
- 8.2 **Materials and Equipment:**
- i. Metal panel complying with clause 6.2 c) above
  - ii. Cotton wool
  - iii. Methyl ethyl ketone solvent
  - iv. Watch glass
  - v. Scratch tester complying with AS 1580.403.1 requirements with a load of 1500g on the needle
- 8.3 **Procedure:**
- 8.3.1 One coat of the mixed paint shall be applied to a metal panel of appropriate size and cured for 7 days.
- 8.3.2 A wad of cottonwool soaked in methyl ethyl ketone shall be placed on the surface of the cured coating and covered by a watch glass.
- 8.3.3 After 10 minutes, the watch glass and cotton wool shall be removed, and the panel dried with a stream of dry clean air
- 8.3.4 The test panel shall then be immediately subjected to a scratch test in accordance with AS 1580.403.1 ensuring that the scratch test is conducted across the area previously covered by the watch glass.
- 8.4 **Results and Assessment:** The coating shall be considered adequately cured provided that it withstands a scratch load of 1500g without penetration of the film through to the base metal.

### 9 APPENDIX C

#### Determination of Scratch Resistance

- 9.1 **Scope:** This method details how the scratch resistance of the coating system shall be determined.
- 9.2 **Materials and Equipment:**
- i. Metal panel complying with clause 6.2 c) above
  - ii. Scratch tester complying with AS 1580.403.1 requirements with a load of 2000g on the needle
- 9.3 **Procedure:**
- 9.3.1 The complete coating system shall be applied in accordance with the manufacturer's instructions and at the recommended total film thickness, to a steel test panel conforming to AS 1580.104.1 which has previously been abrasive blast cleaned to Class 2 ½ finish of AS 1627.4.
- 9.3.2 The first and intermediate coats of the system shall be allowed to cure for 24 hours and the final system to cure for 7 days.
- 9.3.3 The coated test panel shall be tested in accordance with AS 1580.403.1 except that the load on the needle shall be adjusted to 2000g.
- 9.3.4 The scratch test is repeated in the same position with the 2000g load until penetration occurs or until 40 scratches have been completed.
- 9.4 **Results and Assessment:** Penetration to the substrate shall not occur in less than 40 scratches.

### 10 APPENDIX D

#### Determination of Impact Resistance

- 10.1 **Scope:** This method details how the impact resistance of the coating system shall be determined.
- 10.2 **Materials and Equipment:**
- i. Metal panel complying with clause 6.2 c) above
  - ii. Impact tester complying with AS 1580.406.1 requirements
- 10.3 **Procedure:**
- 10.3.1 The complete coating system shall be applied in accordance with the manufacturer's instructions and at the recommended total film thickness, to a steel test panel conforming to AS 1580.104.1 which has previously been abrasive blast cleaned to Class 2 ½ finish of AS 1627.4.
- 10.3.2 The first and intermediate coats of the system shall be allowed to cure for 24 hours and the final system to cure for 7 days.
- 10.3.3 The coated test panel shall be tested in accordance with AS 1580.406.1.
- 10.4 **Results and Assessment:** The coating shall not display any cracking and shall remain firmly adherent when subjected to a direct impact of 1.5 Joule.

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**11 APPENDIX E****Determination of Adhesion**

- 11.1 **Scope:** This method details how the adhesion of the coating system shall be determined.
- 11.2 **Materials and Equipment:**
- Metal panel complying with 6.2 c) above
  - Apparatus and equipment complying with AS 1580.408.2 (Method B) requirements
- 11.3 **Procedure:**
- 11.3.1 The complete coating system shall be applied in accordance with the manufacturer's instructions and at the recommended total film thickness, to a steel test panel conforming to AS 1580.104.1 which has previously been abrasive blast cleaned to Class 2½ finish of AS 1627.4.
- 11.3.2 The first and intermediate coats of the system shall be allowed to cure for 24 hours and the final system to cure for 7 days.
- 11.3.3 The coated test panel shall be tested in accordance with AS 1580.408.2 (Method B).
- 11.4 **Results and Assessment:** The coating system shall not show an adhesion rating of greater than 1, for both the coating to the substrate and between successive coats.

**12 APPENDIX F****Determination of Resistance to Aviation Fuels**

**NOTE:** This test **must** be performed by a laboratory approved by the DST. The CSIRO Materials and Durability Laboratory is such an example of a DST-approved facility. Contact: Money Arora (T: +61 3 9545 8774, E: [money.arora@csiro.au](mailto:money.arora@csiro.au)) for further information.

- 12.1 **Scope:**
- 12.1.1 This method details how the resistance of the coating system to aviation fuel immersion shall be determined.
- 12.1.2 The determination shall be carried out in triplicate.
- 12.2 **Materials and Equipment:**
- Test fuels AVCAT, AVTUR and AVGAS complying with Defence specifications described in clause 4 above. Standard Unleaded Petrol with a RON of 91 (UL91) is a suitable replacement for AVGAS. UL91 is defined in (UK) Defence Standard 91-090
  - Balance to 0.001g accuracy
  - Suitable sealable containers to hold fuel and test panels
  - Scratch resistance tester as per clause 9, Appendix C above
  - Adhesion testing as per clause 11, Appendix E above

**12.3 Procedure:**

- 12.3.1 For each type of fuel, prepare 3 steel panels for scratch resistance test (as in clause 9, Appendix C) and 3 for adhesion test (as in clause 11, Appendix E) – total of 18 panels.
- 12.3.2 Apply the coating to both sides of all panels.
- 12.3.3 The first and intermediate coats of the system shall be allowed to cure for 24 hours and the final system to cure for 21 days. Clearly identify each panel.
- 12.3.4 Weigh the panels to be used for the adhesion tests and record the results.
- 12.3.5 Retain a reference sample of each of the test fuels in suitable individual, clean, sealable cans or jars for testing and comparison.
- 12.3.6 All the tests shall be completed within the specified shelf life of the fuels.
- 12.3.7 Place 1 scratch and 1 adhesion test panel into a suitable container, cover completely with the specified fuel ensuring that the fuel has ready access to all parts of each panel.
- 12.3.8 Seal the container to prevent the loss of volatiles from the fuels. Repeat this procedure with the other 2 pairs of test panels and the same fuel.
- 12.3.9 Repeat 12.3.7 and 12.3.8 above for two additional containers with the same fuel type.
- 12.3.10 Repeat 12.3.7 and 12.3.8 above for the other two types of fuel. This will result in 9 containers of fuel each with 2 panels in them.
- 12.3.11 Prepare 3 additional containers as in 12.3.7 and 12.3.8 above but containing fuel only to act as references.
- 12.3.12 Each of the 12 containers shall be stored in a secure and darkened area for 25 weeks. The storage area shall be appropriate to the fuel being used with regards occupational health and safety requirements.
- 12.3.13 On completion of the immersion period, remove all test panels and allow to air dry. Transfer the fuel from each test container to suitable individual, clean, sealable cans or jars.
- 12.3.14 Examine the coating system on each test panel 24 hours after removal from the fuel and report all visible defects.
- 12.3.15 Weigh the adhesion test panels. There shall be no gain in mass of the panels exceeding 15g/m<sup>2</sup>.
- 12.3.16 Determine the scratch resistance of the 3 panels in accordance with clause 9, Appendix C. Penetration to the substrate shall not occur in less than 40 scratches.
- 12.3.17 Determine the adhesion of the 3 panels in accordance with clause 11, Appendix E. The coating system shall not show an adhesion rating of greater than 1, for both the coating to the substrate and between successive coats.



## COATINGS FOR AVIATION FUEL TANK INTERNAL LINING

### 13 APPENDIX G

#### Determination of Effect on Aviation Fuels

**NOTE:** This test **must** be performed by a laboratory approved by the DST. The CSIRO Materials and Durability Laboratory is such an example of a DST-approved facility. Contact: Money Arora (T: +61 3 9545 8774, E: [money.arora@csiro.au](mailto:money.arora@csiro.au)) for further information.

#### 13.1 **Scope:**

13.1.1 It is important that the coating systems itself has no effect on the fuels that may adversely affect its performance. An example of a possible defect is gelation of the fuel.

13.1.2 This method details how the effect of the coating system on the fuels shall be determined.

#### 13.2 **Materials and Equipment:**

- i. Fuels remaining from the test in clause 12, Appendix F above

#### 13.3 **Procedure:**

13.3.1 On completion of the tests detailed in clause 12, Appendix F above, examine the fuels in which the panels have been immersed.

13.3.2 Examine the test fuels and reference fuels as follows:

- i. DEF(AUST) 5207 and DEF(AUST) 5240: Determine existent gum content in accordance with ASTM D381 / IP131, and thermal stability JFTOT in accordance with ASTM D3241 / IP323.
- ii. DEFSTAN 91-90: Determine existent gum content in accordance with ASTM D381 / IP131

#### 13.4 **Results and Assessment:**

13.4.1 When compared to fresh unused fuels, the fuels used for the immersion tests shall not exhibit any observable gelling, polymerisation or other deterioration.

13.4.2 When compared to fresh unused fuels, the fuels used for the immersion tests shall not have an increase in existent gum content of greater than 3.0mg / 100mL as defined in the specifications nominated in 13.3.2 i. and ii. above.

13.4.3 The fuel used for the immersion tests shall remain within the respective specified limits of the specification with respect to thermal stability as defined in the specifications nominated in 13.3.2 i. above.

### 14 APPENDIX H

#### Determination of Resistance to Water

#### 14.1 **Scope:**

14.1.1 This method details how the resistance of the coating system to immersion in water shall be determined.

14.1.2 Condensation water can build up on the cool, dark sides of the inside of fuel storage tanks.

#### 14.2 **Materials and Equipment:**

- i. Distilled water
- ii. Oven or other means of maintaining test samples at  $50 \pm 2^\circ\text{C}$  for 21 days

#### 14.3 **Procedure:**

14.3.1 The complete coating system shall be applied in accordance with the manufacturer's instructions and at the recommended total film thickness, to a steel test panel conforming to AS 1580.104.1 and of minimum dimensions 100 x 100 x 3 mm which has previously been abrasive blast cleaned to Class 2 ½ finish of AS 1627.4.

14.3.2 Apply the coating system to both sides and all edges of the panel. The first and intermediate coats of the system shall be allowed to cure for 24 hours and the final system to cure for 21 days.

14.3.3 Immerse the panel in distilled water at  $50 \pm 2^\circ\text{C}$  for 21 days. The container shall be sealed to prevent the loss of water.

14.4 **Results and Assessment:** At the end of the immersion period, remove the panel, allow to dry and inspect. The coating system shall show no signs of blistering, cracking, corrosion or other integrity failure.

### 15 APPENDIX I

#### Determination of Resistance to FSII (Fuel System Icing Inhibitor)

**NOTE:** This test **must** be performed by a laboratory approved by the DST. The CSIRO Materials and Durability Laboratory is such an example of a DST-approved facility. Contact: Money Arora (T: +61 3 9545 8774, E: [money.arora@csiro.au](mailto:money.arora@csiro.au)) for further information.

#### 15.1 **Scope:**

15.1.1 This method details how the resistance of the coating system to immersion in FSII shall be determined.

15.1.2 FSII is an additive to aviation fuels designed to prevent icing up of the fuel system during flight. It is essentially diethylene glycol monomethyl ether (DEGME).

#### 15.2 **Materials and Equipment:**

- i. FSII complying with 4 b) iv. above
- ii. Oven or other means of maintaining test samples at  $40 \pm 2^\circ\text{C}$  for 10 weeks
- iii. Suitable sealable containers to hold fuel & test panels

#### 15.3 **Procedure:**

15.3.1 The complete coating system shall be applied in accordance with the manufacturer's instructions and at the recommended total film thickness, to a



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steel test panel conforming to AS 1580.104.1 and of minimum dimensions 100 x 100 x 3 mm which has previously been abrasive blast cleaned to Class 2 ½ finish of AS 1627.4.

- 15.3.2 Apply the coating system to both sides and all edges of the panel.
- 15.3.3 The first and intermediate coats of the system shall be allowed to cure for 24 hours and the final system to cure for 21 days.
- 15.3.4 On 1 panel, cut a cross (X) to base metal on one side of the panel. The cross shall be in the middle of the panel and each arm of the cross shall be approximately 30mm in length.
- 15.3.5 Immerse the panels in an aqueous solution of 40% FSII for 10 weeks at 40°C.
- 15.3.6 The container shall be sealed to prevent the loss of water and FSII.

### 15.4 **Results and Assessment:**

- 15.4.1 At the end of the immersion period, remove the panel, allow to dry and inspect. The coating system shall show no signs of blistering, cracking, corrosion or other integrity failure.
- 15.4.2 In addition, the panel with the crosscut through the coating shall exhibit no rusting beyond 1mm from the sides of the scratch.



# SPECIFICATION AP-S0212



## COATINGS FOR AVIATION FUEL TANK INTERNAL LINING

16 TABLE 1: PERFORMANCE PROPERTIES

TEST	AS/NZS 1580 METHOD	REQUIREMENTS
<b>For each COMPONENT of the System</b>		
<b>WET Paint Tests – each COMPONENT of the system</b>		
Preliminary Examination	103.1	To be readily reincorporated. Shall be free of coarse particles, gel and foreign matter.
Viscosity	214.x	To be recorded for the mixed product.
Pot Life	Clause 7, Appendix A	Consistency shall not change by more than 15% after standing for the manufacturer's recommended pot life time which shall not be less than 1.5 hours.
Application Properties - Brushing	205.1	Shall be suitable for application by brush to small areas having satisfactory application properties and the dry film shall be free of defects. The presence of some brush marks is acceptable.
Application Properties - Spray	205.2 or 205.4	Shall be suitable for application by conventional air or airless spray with satisfactory application properties and the dry film shall be free of defects.
Recoating Properties	404.1	When one coat is applied to a steel test panel and cured for 24 hours before application of a second coat of paint, the recoated panel shall not show any evidence of wrinkling, patchiness or lifting of the previous coat.
	408.4	The recoat intercoat adhesion shall not be less than a rating of 1.
Reincorporation after Storage	211.2	Each component shall comply with all the preceding requirements after 12 months storage at ambient temperature.
Degree of Setting	211.1	Settling shall not fall below 6.
Aged Application	205.2 or 205.4	In addition, the use of spray application shall produce a uniform finish typical of the un-aged product type.
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.
<b>ADDITIONAL WET Paint Tests – Topcoats ONLY</b>		
Non-volatile content by Volume (Volume Solids)	301.2	Minimum 48%. <ul style="list-style-type: none"> <li>Volume solids may be determined theoretically from raw material data except where solid constituents incorporate sealed air voids.</li> </ul>
Fineness of Grind	204.1	Maximum 40µm.



# SPECIFICATION AP-S0212



## COATINGS FOR AVIATION FUEL TANK INTERNAL LINING

TEST	AS/NZS 1580 METHOD	REQUIREMENTS
<b>For each COMPONENT of the System (Cont.,)</b>		
<b>DRY Paint Film Tests – each COMPONENT of the system</b>		
Surface Dry Condition	401.1	Maximum 9 hours.
Hard Dry Condition (Mechanical Thumb Test)	401.6	Maximum 18 hours.
Colour - Visual comparison	601.1	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.
Curing Properties	Clause 8, Appendix B	Shall resist a scratch load of 1500g.
<b>ADDITIONAL DRY Paint Tests – Topcoats ONLY</b>		
Colour - Visual Comparison	601.1	The finishing coat shall be an approximate match to AS2700 Y35 Off-White.
Specular Gloss	602.2	Minimum 20 units at 60° after 7 days curing.
<b>For the COMPLETE System</b>		
<b>Dry Paint Tests</b>		
Scratch Resistance	Clause 9, Appendix C	No penetration to substrate after 40 passes.
Impact Resistance	Clause 10, Appendix D	The coating shall not display any cracking and shall remain firmly adherent when subjected to a direct impact of 1.5 Joule.
Adhesion	Clause 11, Appendix E	Adhesion rating $\leq 1$ .
Resistance to Aviation Fuels	Clause 12, Appendix F	No evidence of softening, cracking or blistering of the paint film. No loss of adhesion or reduction in scratch resistance. Mass increase not to exceed 15g/m <sup>2</sup> .





## SPECIFICATION AP-S0212



### COATINGS FOR AVIATION FUEL TANK INTERNAL LINING

TEST	AS/NZS 1580 METHOD	REQUIREMENTS
<b>For the COMPLETE System (Cont.,)</b>		
<b>Dry Paint Tests (Cont.,)</b>		
Effect on Aviation Fuels	Clause 13, Appendix G	The coating system shall not cause any observable gelling, polymerisation or deterioration of the test fuels when compared with new fuel held for the duration of the testing (clause 12, Appendix F) in identical containers. The fuel used for the immersion tests shall not increase existent gum content more than 3.0mg / 100mL when compared with reference fuel held for the duration of the testing (clause 12, Appendix F) in identical containers. The fuel used for the immersion tests shall remain within the respective specified limits of the specification with respect to the thermal stability as defined in the appendix.
Water Resistance	Clause 14, Appendix H	No integrity failure.
Resistance to Icing Inhibitor	Clause 15, Appendix I	No integrity failure. Minimal corrosion at cut.



# SPECIFICATION AP-S0212



## COATINGS FOR AVIATION FUEL TANK INTERNAL LINING

### 17 APPENDIX J

#### Document History

Status: Current  
Version: 17  
Date Published: 10-09-2021

Document Version No.:	Date Published:	Summary of Changes:
17	10-09-2021	<ul style="list-style-type: none"><li>• General format changes</li><li>• Updated CSIRO Materials Durability contact person information</li><li>• Updated background information in clause 2</li><li>• Updated SUSMP information</li><li>• Updated APAS website information</li></ul>
16	30-11-2020	<ul style="list-style-type: none"><li>• Addition of Appendix J (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</li><li>• Addition of "People + Product = Protection" to Footer</li></ul>
15	15-12-2019	<ul style="list-style-type: none"><li>• Included approval for use of unleaded petrol UL91 as substitute for AVGAS and clarification to the Existent gum acceptable limits</li></ul>
14	15-12-2011	<ul style="list-style-type: none"><li>• Document re-formatted and editorial changes</li><li>• Re-organisation of Table 1</li></ul>
13	02-03-2006	<ul style="list-style-type: none"><li>• Updated details of DSTO approved laboratories for conduct of testing of Appendices</li></ul>
12	11-05-2005	<ul style="list-style-type: none"><li>• Clarified the fuel testing requirements in Table 1 and clause and Appendix G</li></ul>
11	-	<ul style="list-style-type: none"><li>• -</li></ul>
10	30-10-2003	<ul style="list-style-type: none"><li>• Clarified the requirement for triplicate testing in Appendix G and updated the general format</li></ul>
9	28-07-2003	<ul style="list-style-type: none"><li>• Corrected definitions of fuel compliance requirements in Section 2 and Appendices F and G</li></ul>
8	05-05-2003	<ul style="list-style-type: none"><li>• Defined DSTO approved labs for conduct of fuel resistance tests</li></ul>
7	22-03-2002	<ul style="list-style-type: none"><li>• Removed low build coating systems as a permissible option and better-defined test methodology (document moving away from old specification number GPC-F-212)</li></ul>