



ALKYD DISRUPTIVE PATTERN PAINT FOR VEHICLES AND EQUIPMENT

1 SCOPE

This specification applies to a paint system used by Australian Defence Forces for the painting and maintenance of Defence vehicles and equipment.

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 a paint system used by Australian Defence Forces for the painting and maintenance of Defence vehicles and equipment.
- Products approved under this specification are low gloss, heat and petrol resistant alkyd finishing enamel with specified infra-red reflectance (IRR) properties. They are designed for use on service vehicles and equipment to provide a disruptive pattern painting (DPP) system.
- The paint system consists of an alkyd primer to APAS specification AP-S0162 and the alkyd finishing coats. The system may be applied to new equipment or over existing aged alkyd or polyurethane paint to produce the disruptive pattern.
- Certified products may be applied by brush or roller or by conventional air spray when thinned with not more than 15% by volume of mineral turpentine. They are surface dry in 30 minutes and may be overcoated after 18 hours.

3.2 Sub-Classes

- This specification incorporates the following sub-classes:
 - 0165/1:** Conventional infra-red reflectance
 - 0165/2:** Near infra-red reflectance (NIRR)

3.3 Basis of this Specification

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

4 REFERENCED DOCUMENTS

- The following standards are referenced in this document:

- AS/NZS 1580** – Paints and related materials: Methods of test
- SAE AMS STD 595** – Colours used in Government Procurement

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

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 be comprised typically of an alkyd resin solution in solvent.

5.2 Volatiles

- The volatile component shall typically be comprised of hydrocarbons.
- For VOC content restrictions, refer to APAS document AP-D181.

5.3 Pigmentation

- There is no restriction placed on the type(s) of pigment used, with the exception that 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 7, Table 1 below.

5.4 Colour

- Products approved under this specification are available in the colours specified in clause 7, Table 1 below. Standard colour swatches may be purchased from APAS.



ALKYD DISRUPTIVE PATTERN PAINT FOR VEHICLES AND EQUIPMENT

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 and clause 8, Table 2 below.
- b) 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

- 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) 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.
- c) 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
- d) 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.
- e) The product shall comply with all requirements of clause 6.3 and 6.4 of APAS document AP-D192.



SPECIFICATION AP-S0165



ALKYD DISRUPTIVE PATTERN PAINT FOR VEHICLES AND EQUIPMENT

7 TABLE 1: PERFORMANCE PROPERTIES

TEST	AS/NZS 1580 METHOD	REQUIREMENTS
Wet Paint Properties		
Preliminary Examination	103.1	To be readily reincorporated. Shall be free of coarse particles, gel and foreign matter.
Fineness of Grind	204.1	Maximum 25µm.
Viscosity	214.x	To be recorded.
Application Properties - Brushing - Rolling - Spraying	205.1 205.3 205.2	Shall show satisfactory application properties and the dry film shall be free of defects. For spray application, after thinning with no more than 15% mineral turpentine, it shall be readily applied and shall produce a uniform film free of defects.
Recoating Properties	404.1	Using methods 205.1, 205.2 or 205.3, apply the paint in successive coats allowing 16 hours between coats. There shall be no working up of the previous coat or development of other film defects during application or drying. Unless otherwise stated, the paint shall be applied at 20 - 30 µm dry film build.
Reincorporation after Storage	211.2	To comply with all the preceding requirements after 12 months storage at ambient temperature.
Degree of Setting	211.1	Settling shall not fall below 6.
Spray Application of Aged Sample	205.2	In addition, the use of spray application shall produce a uniform finish typical of the product type. Unless otherwise stated, the paint shall be applied at 20 - 30 µm dry film build.
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 Properties (Unless otherwise stated, the paint shall be applied at 20 - 30 µm dry film build)		
Finish	603.1	One coat applied by brush to a sealed card shall give a smooth film of uniform appearance with only slight brush marks.
Surface Dry Condition	401.1	Maximum 30 minutes.
Hard Dry Condition (Mechanical Thumb Test)	401.6	After 4 hours drying under laboratory routine conditions, the film shall not be marked.
Dry Hiding Power (Contrast Ratio)	213.2	Not less than 98% at 16m ² /L.



SPECIFICATION AP-S0165



ALKYD DISRUPTIVE PATTERN PAINT FOR VEHICLES AND EQUIPMENT

TEST	AS/NZS 1580 METHOD	REQUIREMENTS
Dry Film Properties (Unless otherwise stated, the paint shall be applied at 20 - 30 µm dry film build) Cont.,		
Colour - Visual comparison	601.1	Close visual match to the standard under D65 illumination. SAE AMS STD 595 colour references: Olive Drab: 34088 Camouflage Tan: 30219 Pilbara Brown: 30109 Black: 37038 Refer to clause 5.4 above for source of colour standards.
Instrumental Colour Difference		Colour difference less than 2.5 CIE units from standard except for Olive Drab – less than 1.5 CIE units.
Specular Gloss (60°)	602.2	7 – 10 GU at 60°.
Infra-red Reflectance	Clause 8, Table 2	Refer to clause 8, Table 2. Infra-red reflectance measurement may employ any spectrophotometer capable of measuring reflectance at 800 nm.
Bend Test	402.1	After air drying for seven days, the film shall show no sign of cracking or loss of adhesion after bending round a 6 mm mandrel.
Scratch Resistance	403.1	After air drying for seven days, the needle shall not penetrate through to the underlying metal under a load of 800g.
Resistance to Impact - Falling Weight Test	406.1	After air drying for seven days, the film shall be subjected to both a direct and reverse impact of 4.5 joules. There shall be no cracking, flaking or loss of adhesion.
Resistance to Natural Weathering	457.1	No integrity failure after 12 months exposure at 45°N at a temperate site and the ratings for change in gloss, discolouration, colour change and chalking shall not exceed 1. Infra-Red Reflectance shall not decrease by more than 5% of the initial IR reflectance. Infra-red reflectance measurement may employ any spectrophotometer capable of measuring reflectance at 800 nm.
Resistance to Accelerated Weathering	483.2	No integrity failure after 500 hours and the ratings for change in gloss, discolouration, colour change and chalking shall not exceed 1. Infra-Red Reflectance shall not decrease by more than 5% of the initial IR reflectance. Infra-red reflectance measurement may employ any spectrophotometer capable of measuring reflectance at 800 nm.
Adhesion	408.4	Crosshatch adhesion result ≤ 2.
Water Resistance	455.1	After air drying for seven days, a panel immersed in distilled water for seven days then removed and allowed to dry for 18 hours shall show no defects and appear identical to an un-immersed panel similarly prepared.



SPECIFICATION AP-S0165



ALKYD DISRUPTIVE PATTERN PAINT FOR VEHICLES AND EQUIPMENT

TEST	AS/NZS 1580 METHOD	REQUIREMENTS
Dry Film Properties (Unless otherwise stated, the paint shall be applied at 20 - 30 μm dry film build) Cont.,		
Mineral Oil Resistance	454.1	After air drying for seven days, a panel immersed in mineral oil at 50°C \pm 2°C for seven days then removed and wiped free of oil, shall show no defects and appear identical to an un-immersed panel similarly prepared.
Petroleum Spirit Resistance	453.1	After air drying for seven days, a panel immersed in petroleum spirit for seven days then removed, dried and examined, shall show no defects and appear identical to an un-immersed panel similarly prepared.
Heat Resistance	407.1	After air drying for seven days, a panel subjected to a temperature of 100°C \pm 3°C for 24 hrs shall show no significant change in colour or gloss, cracking or loss of adhesion.

8 TABLE 2: INFRA-RED REFLECTANCE REQUIREMENTS

	Conventional IR Sub-class 0165/1 only	NIRR Sub-class 0165/2 only
Camouflage Green	40-50%	> 60%
Camouflage Tan	20-30%	> 70%
Pilbara Brown	20-30%	> 70%
Black	< 10%	> 65%



SPECIFICATION AP-S0165



ALKYD DISRUPTIVE PATTERN PAINT FOR VEHICLES AND EQUIPMENT

9 APPENDIX A

Document History

Status: Current
Version: 12
Date Published: 30-08-2021

Document Version No.:	Date Published:	Summary of Changes:
12	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
11	24-11-2020	<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
10	06-07-2009	<ul style="list-style-type: none">• Removed an SSL reference in 5.4 and was updated for format
9	31-10-2003	<ul style="list-style-type: none">• Removed references to GPC and incorporated a general format update
8	07-05-2001	<ul style="list-style-type: none">• Divided the infra-red reflectance requirements into two sub-classes: 0165/1 and 0165/2
7	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-E-165)