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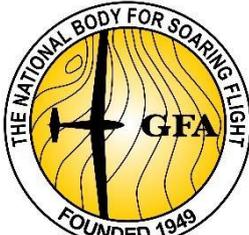
# AIRWORTHINESS DIRECTIVE

THE GLIDING FEDERATION OF AUSTRALIA Inc

## GFA AD 278 Issue 3

**Date:** 7<sup>th</sup> March 2016

Note: This Airworthiness Directive is issued by the Gliding Federation of Australia

<b>Type Certificate Holder</b>	General AD not specific to type
<b>Manufacturer</b>	General AD not specific to type.
<b>Types/Models Affected</b>	All Sailplanes/Powered Sailplanes having a structural FRP, wing, fuselage, tailplane or control surface skin finished in GEL Coat.
<b>Serial Numbers</b>	All serial numbers
<b>Subject</b>	<b>SAILPLANE REFINISHING ALTERNATE MATERIALS AND PROCESS</b>
<b>Implementation</b>	<b>MANDATORY</b> Aircraft owners shall execute this AD when refinish a FRP Sailplane or Powered Sailplane
<b>Background</b>	Based on in service experience it has been found to that Vorgelat gel-coat is not suitable for the Australian operating environment.
<b>Documentation</b>	Manual Of Standard Procedures 3 GFA AN 69 Basic Sailplane Engineering
<b>Required Action(s)</b>	At time of Sailplane/powered sailplanes next refinish, refinisher is to apply materials approved via this AD only
<b>Compliance, Compliance Time(s) and Frequency</b>	Compliance with this Airworthiness Directive is mandatory and compliance, including action taken pursuant to this Airworthiness Directive must be recorded in the aircraft log book.
<b>Effect on Weight and Balance</b>	Sailplane/Powered Sailplane is to be reweighed at completion of refinish. Refer Manual Of Standard Procedures 3
<b>Effective Date</b>	07/03/2016
	<p>Issued by: Rob Hanbury</p> <p>Chairman, GFA Airworthiness Department</p>

## **1. Introduction**

This Airworthiness Directive is addressing the following 2 points;

1. Experience gained through Australian registered sailplanes and powered sailplanes finished in Vorgelat gel coat has demonstrated over time that it is not a suitable finish for the Australian operating environment. GFA AN 69 provides details of the failure mechanisms of polyester gel coats.
2. There has been a need to redo unsatisfactory refinishing jobs because either insufficient gel-coat was removed or the chosen new finishing system was inappropriate.

Irrespective of the type of finish being removed the quality control process must ensure that;

1. All cracks likely to have transferred from the external finish to the structure are found and removed.
2. All damage incurred by removing cracks and general sanding is found and repaired.
3. The finished sailplane has correctly balanced control surfaces and the whole sailplane weighed and appropriately placarded.
4. Logbook entries that confirm for future owners/operators that the refinishing process was properly undertaken.

Issue 3 of AD 278 seeks to provide details of acceptable materials to use when refinishing sailplanes.

Note : This AD is to be read in conjunction with the requirements of GFA Manual of Standards, AN 69 and Basic Sailplane Engineering.

## **2. RTO/A Notification**

Irrespective of the extent of exterior finish to be replaced the RTO/A is to be notified of the intention to strip and re-finish.

The RTO/A will then ensure that;

1. An independent inspector (unless the individual is approved per MOSP) is nominated to check the structure prior to the surface being refinished.
2. Repairs are classified as "minor" or "major" as appropriate.
3. Correct procedures and equipment are used for control surface and total sailplane weight and balance determination.

## **3. Independent Inspector**

The independent inspector or approved person will be responsible for (Refer Appendix A);

1. Ensuring that all cracks transferred from the external finish into the glass/epoxy or carbon/epoxy skins have been removed.
2. Ensure that no cracks are evident running chordwise in the skin layers attached to the wing main spar caps.

3. Inspection after skin repairs have been completed ensuring that all cracks have been removed and all damage repaired.
4. Completing a logbook entry recording satisfactory completion of inspection (1), (2) and (3).

#### **4. Repairs**

Minor skin repairs are to be completed by persons rated as minor FRP repair, in accordance with the GFA MOSP.

Skin repairs larger than “minor” including complete surface sheathing, are to be completed by persons rated as major repair, in accordance with the GFA MOSP.

#### **5. Approved Polyester Gel-Coat Replacements**

Effective from the date of issue of this AD, Vorgelat gel-coat **is no longer** to be re-applied to any Australia registered sailplanes or powered sailplane.

Due to local restrictions the availability of many materials called out in the approved maintenance documentation for the glider can't be sourced or brought into Australia. As such the gel-coat products listed in AIR\_D0023 can be used in lieu of the gel-coat product called out in the maintenance documentation.

#### **6. Alternates to Polyester Gel Coat for Refinishing**

The most important outcome during refinishing is the prevention of fluid and ultraviolet damage to the underlying aircraft structure. Resins can be affected by prolonged water contact, the freeze/thaw action or ultraviolet light resulting in damage to the composite structure below.

Composites do not corrode; therefore corrosion inhibiting pigments do not function on composites. The principal corrosion inhibiting pigments used in primers are metal chromates. A key function of chromate pigments is that they are hygroscopic and partially dissolve in water, delivering corrosion protection to exposed metal. This solubility is undesirable for composite primers as it causes water absorption. Chromate free primers will provide a better water barrier for composite components.

Therefore selection and application of the correct primer appropriate for use on composite materials is essential.

Chrome-free primers meeting the following specifications are permitted for use on gliders or powered sailplanes without restriction;

- BMS 10-126
- BMS 10-103
- BAMS 565-014
- DHMS C4.01
- CMS-CT-206
- MEP 10-070
- MCS9010

Primers not meeting the above specifications but listed in AIR\_D0023 are approved for use.

Top Coats and Base Coat Clear Coats meeting the following specifications are permitted for use on gliders or powered sailplanes without restriction;

- BMS 10-60
- BMS 10-72
- BMS 10-125

Top Coats and Base Coat Clear Coats not meeting the above specifications but listed in AIR\_ D0023 are approved for use.

To ensure maximum compatibility and longevity of the paint it is strongly recommended that the primer and top coat are both from the same manufacturer. It is the refinishers responsibility to ensure the compatibility of the paint system.

## **7. Material Safety**

All paint products have some level of health risk associated with inhalation and or skin contact. It is important that the Material Safety Data Sheet for all material used is obtained and reviewed prior to application.

## **8. Partial Removal of the Gel-Coat Surface During Refinishing**

Note the following section **is not** to be applied to Sailplanes or Powered Sailplanes finished in Vorgelat or in Gel Coat for which the finish can't be determined. In this situation complete removal of the gel coat surface is required prior to refinishing.

1. Ensure any cracks in the old polyester gel coat have been removed in particularly ensure that no chord-wise surface cracks are present in the area of the wing spar caps. This is to be completed using dyes and magnifying glass to identify any cracks within the surface. Continue to remove the old gel coat surface until all cracks have been removed.
2. Prior to refinishing the surface an RTO-A, CAD, DCAD or other person delegated by the CAD is to inspect the final prepared surface.
3. The registered owner of the aircraft is to be advised of the partial removal of the gel coat and the potential of further cracks to develop in the surface in the future.
4. A Logbook entry is to be made identifying that partial removal of the gel coat was undertaken during the refinish.

## **9. Moving from a Gelcoat to Polyurethane Finish**

Where an alternate paint system has replaced polyester Gel-Coat on the glider or powered sailplane and is not covered by approved data in the aircrafts AMM an Engineering Order is to be sort to approve the substitution.

#### **10. Amendments and Additions to AIR D0023**

From time to time AIR\_D0023 will be revised to include or remove approved materials based on product availability, in-service experience or newly identified products. The CAD or DCAD has the responsibility to update and ensure the suitability of any proposed additions or deletions to the approved list.

#### **11. Control Surface Re-Balance**

All control surfaces must be brought into line with the manufacturer's weight and mass balance limits. Where these do not exist, surfaces are to have their degree of balance measured before re-finishing is started and returned to the degree of balance on completion of the re-finish.

#### **12. Total Weigh and Balance**

The sailplane/ powered sailplane is to be reweighed on completion by a person authorised per GFA MOSP.

#### **13. Wing Frequency**

Wing frequency is to be measured before and after external finish is removed and replaced. Both values are to be recorded in the sailplanes logbook.

## Appendix A

### Inspection of Wing Skins

For those wings built as shown in the cross-section below, where the external wing skins are bonded directly to the spar flange (spar rovings) it is essential that after exterior finish removal, no transferred cracks are left in the material chord wise across the spar caps.

Use of a dye trace is recommended plus inspection with a magnifying glass.

Any cracks found must be removed and the structure repaired as necessary before re-finishing is commenced.

This inspection is critical on those sailplanes/ powered sailplanes that are being refinished for the second or third time, most likely only having had part of the original gel coat removed. The cracks left in the old gel coat are likely to have continued to "transfer" into the wing skins without showing visually as cracks in the exterior finish.

