

GLIDING NEW ZEALAND

ADVISORY CIRCULAR

MYLAR SEALS

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1 Introduction

1.1 This Advisory Circular provides guidance on the following:

INSTALLATION OF PRE-CURVED MYLAR SEALS

Acknowledgment

Gliding New Zealand wishes to acknowledge the primary source of this A/C is Mod. WGC-1017/01, issued by the Wellington Gliding Club.

Aim

To install Pre-Curved Mylar Sealing Strips over a Glider's ailerons, flaps, elevator and rudder for the purposes of performance enhancement and improved control response

References

For further technical information concerning this installation please refer to the following:

ASW-20c Maintenance Manual

Required Actions

Part 1: Measurement of control surface gap

The gap between the trailing edge of the wing/tailplane/fin and the tangential edge of the control surface is to be measured with a flexible steel tape. Consider Fig.1 when making this measurement to determine the appropriate width of the Pre-Curved Mylar strip. The control should be actioned at the control column to the limiting stop position for measurement. The correct strip width is determined as the measured gap + 10mm. Consideration should be given to the position of the control surface when the control is disconnected during rigging and de-rigging. The Mylar seal is not permitted to catch at any time on the leading edge of the control surface.

IMPORTANT

Mylar seals may only be installed on locations where the attaching surface is flat over the length of the attachment. Because the Mylar is Pre-Curved it will not seat properly to a curved surface.

Part 2: Surface preparation

The trailing edge is sanded back to a dull finish with 400 grit sandpaper for the adjacent length of the control surface over a width approx 10-12mm wide. It is recommended that masking tape be laid along the wing surface with the trailing edge at the correct distance determined in part 1 above. This tape then to be removed after sanding and prior to cleaning. When sanded back to a dull finish ensuring all surface polish is removed, the sanded area is then cleaned with acetone to remove any loose paint dust remaining on the surface. Where the utmost performance is demanded, the paint can be completely removed by routing to allow a flush fitting of the Pre-Curved Mylar to the existing surface. The structural surface may NOT

be routed. Should the surface be cut by routing, the damage is to be repaired using approved techniques for that material.

Part 3: Installing the Transfer Tape

Install a strip of Transfer Tape along the trailing edge for the adjacent length of the control surface. The tape should be cut cleanly with a sharp blade at both ends. When installing Transfer tape, care should be taken not to get fingerprints on the exposed adhesive strip or the sanded area of the trailing edge. The Transfer Tape is to be rolled to ensure good adhesion. Where air bubbles are detected, judicious use of a hot air gun can be used to work the bubbles out. Pricking the surface with a needle is not recommended as it produces a raised point on the Transfer Tape which will compromise the bond to the Mylar at that point. If the bubbles cannot be worked out the Transfer tape is to be removed and the wing prepared again from part 2.

Part 4: Installing the Mylar Strip

Install the Pre-Curved Mylar strip over the exposed upper surface of the Transfer Tape. Care should be taken to ensure the strip is installed straight. If the strip is not straight it will not seat cleanly on the control surface, and may tend to flutter. The Mylar's leading edge is to align with the leading edge of the Transfer Tape to ensure the trailing edge sits in the desired position measured in part 1 and as shown in Fig. 3. Once the Mylar is located it is rolled to achieve good adhesion to the Transfer Tape. Judicious use of a hot air gun is recommended to work the Mylar into the correct position.

Part 5: Installing the Safety Tape

Install the thin non stretch PVC safety tape over the leading edge line of the Mylar. The safety tape to lap evenly to the surface of the Mylar and the surface of the glider as shown in Fig 4. The tape should extend approximately 1cm beyond each end of the Mylar sealing strip. Care should be taken when installing the safety tape, due to its thin nature it is prone to trapping air bubbles. These bubbles can be removed with judicious use of a hot air gun, and the use of a needle is permitted here. The safety tape is to be worked down hard into the leading edge of the Mylar to protect against lifting from the airflow in flight.

Part 6: Control deflection test

The control movements of the glider are to be checked by moving the control column to the control limits. The movement of the Mylar seals is closely observed to ensure correct and even deflection, with no significant lifting from the control surface. After the test has been completed at least 5 times, the adhesion of the seal is to be inspected to ensure the seal has not lifted. If lifting is found the seal is to be rolled to restore adhesion. Judicious use of a hot air gun may be helpful to soften the glue of the Transfer Tape. When the seal has adhered the control movement test is to be repeated. If the seal continues to lift or cannot be worked down correctly on the Transfer Tape, then the seal should be removed and replaced in accordance with parts 2-6.

Part 7: Flight Manual Supplement

The maintenance section of the Glider's flight manual is to be supplemented with appendix A of this modification entitled "Inspection and Maintenance of Mylar seals".

Internal seals

In addition to the above procedure, internal seals may be installed to further reduce drag, and improve control response. These options are listed in Appendix B.

Weight and Balance

There is no significant change to the weight of the glider. The location of the centre of gravity is not affected.

Appendix A

Installation and Maintenance of Mylar seals

This sailplane has been fitted with Pre-Curved Mylar control seals for the purpose of performance enhancement and improved control response. This modification requires the following maintenance to remain in an airworthy condition.

1. During the Daily Inspection each flying day the Mylar is to be inspected closely for signs of the Mylar lifting from the Transfer Tape. If lifting is found the Sailplane may not be flown until the seal has been reattached, removed or replaced.

The controls are to be actioned to the extremes of their movements to be certain that the Mylar is deflecting correctly. If the Mylar is not deflecting evenly, or shows signs of buckling, the seal is to be reworked into the correct position, removed, or replaced.

IMPORTANT

After the sailplane has been flown at altitudes where the ambient temperature is below freezing, the seals are to be inspected before the next flight. If lifting is detected, repair cannot be effected until the components have returned a temperature above 12 degrees Celsius. Use of a hot air gun is NOT recommended here as it will almost certainly cause differential expansion of the seals and the sailplane's structure. This may damage the structure of the sailplane. Once the temperature of the components is above 12 degrees Celsius the seals can be repaired, removed or replaced.

2. During every Annual Inspection the Mylar seals are to be test lifted along their trailing edges to ensure good adhesion still exists. Where the seal lifts, it may be rolled back down and retested. Judicious use of a hot air gun may be helpful to soften the glue of the Transfer tape. Where it is not possible to get the seal to adhere again to the Transfer Tape the seal is to be replaced in accordance with this A/C.

The safety tape along the leading edge of the Mylar is to be inspected for good adhesion, no lifting at the leading edge, and splitting along the edge of Mylar. Should any of these faults be found the safety tape is to be replaced in accordance with this A/C.

3. When cleaning the sailplane, care should be taken not to wipe the surface against the direction of the Mylar seal. Repeated rubbing against the direction of the seal will disturb and lift the seal. A thin, dry cloth should be used to remove any build-up of dust and grime under the seal from time to time. This will prevent the rubbing surface of the control from becoming worn.

Approved Materials

3M double sided Transfer Tape	9mm Wide
Pre-Curved Mylar Sealing Strip (German)	22-35mm Wide
PVC "anti-peel" Safety Tape	12mm Wide

Appendix B

Installation Options For Internal Seals

The following internal seals may be used in conjunction with external Pre-Curved Mylar seals or installed independently:

3M Vee Seal

The control is dismantled, and Vee-Seal is installed on the inside of the control box as shown in Fig. 5. The inside surface of the control box is sanded smooth with 240/400 grit sandpaper and cleaned with acetone. The Vee-Seal is folded to a 45 degree angle and stuck to the inside surface using the self-adhesive strip on one face of the strip. Once the seal is in place the control is remounted and checked for free movement and correct deflection.

Teflon Internal Sealing Tape

The control is dismantled, and the control box and leading edge of the control are sanded, cleaned, and taped with Transfer Tape. The Teflon tape is bonded to the control box then lapped back in an S shape to adhere to the leading edge of the control as shown in Fig. 6. The tape is 50mm wide and affords sufficient slack to allow the control to be remounted. Once the seal is in place the control is remounted and checked for free movement and correct deflection.

Seconite Fabric

This material can be used as per the instruction for the Teflon Tape. Seconite may be cut to any width required and may be useful for larger controls, or where the control must move sideways to be removed. Once the seal is in place the control is remounted and checked for free movement and correct deflection.

Logbook.

Make logbook entry.