
Type Acceptance Report

TAR 23/21B/9

SCHLEICHER AS 33 Series

TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
1. INTRODUCTION	1
2. AIRCRAFT CERTIFICATION DETAILS	1
3. APPLICATION DETAILS AND BACKGROUND INFORMATION	2
4. NZCAR §21.43 DATA REQUIREMENTS	3
5. NEW ZEALAND OPERATIONAL RULE COMPLIANCE	4
ATTACHMENTS	7
APPENDIX 1 – NZ TYPE ACCEPTANCE HISTORY	7
APPENDIX 2 – THREE-VIEW DRAWING	8

Executive Summary

New Zealand Type Acceptance has been granted to the Schleicher AS 33 Series based on validation of Type Certificate number EASA.A.656. There are no special requirements for import.

Applicability is currently limited to the Models and/or serial numbers detailed in Section 2, which are now eligible for the issue of an Airworthiness Certificate in the Standard Category in accordance with NZCAR §21.191, subject to any outstanding New Zealand operational requirements being met. (See Section 5 of this report for a review of compliance of the basic type design with the operating Rules.) Additional variants or serial numbers approved under the foreign type certificate can become type accepted after supply of the applicable documentation, in accordance with the provisions of NZCAR §21.43(c).

NOTE: The information in this report was correct as at the date of issue. The report is generally only updated when an application is received to revise the Type Acceptance Certificate. For details on the current type certificate holder and any specific technical data, refer to the latest revision of the State-of-Design Type Certificate Data Sheet referenced herein.

1. Introduction

This report details the basis on which Type Acceptance Certificate No. 23/21B/9 was granted in the Standard Category in accordance with NZCAR Part 21 Subpart B.

Specifically, the report aims to:

- (a) Specify the foreign type certificate and associated airworthiness design standard used for type acceptance of the model(s) in New Zealand; and
- (b) Identify any special conditions for import applicable to any model(s) covered by the Type Acceptance Certificate; and
- (c) Identify any additional requirements which must be complied with prior to the issue of a NZ Airworthiness Certificate or for any subsequent operations.

The report notes the status of all models included under the State-of-Design type certificate which have been granted type acceptance in New Zealand, which are listed in Section 2. The history of the Schleicher AS 33 Series type acceptance in New Zealand under type certificate EASA.A.656 is listed in Appendix 1.

2. Aircraft Certification Details

(a) State-of-Design Type and Production Certificates:

Manufacturer: Alexander Schleicher GmbH & Co.
Type Certificate: EASA.A.656
Issued by: European Union Aviation Safety Agency
Production Approval: DE.21G.0010

(b) Models Covered by the Part 21B Type Acceptance Certificate:

(i) **Model:** AS 33 Es
MCTOW: 550 kg (1212 lb.) – 15m wingspan
600 kg (1322 lb.) – 18m wingspan
Max. No. of Seats: 1
Noise Standard: Not Applicable
Engine: SOLO 2350e (per Technical Note 4603-16)
Type Certificate: E.219
Issued by: European Union Aviation Safety Agency
Propeller: AS2F1-3/L100-56-N2
Type Certificate: P.004
Issued by: European Union Aviation Safety Agency

Note: Refer to Advisory Circular 21-1 Appendix 2 for the New Zealand type acceptance status of any engines and propellers listed above.

3. Application Details and Background Information

The application for New Zealand type acceptance of the Schleicher AS 33 Es was from Sailplane Services 2005 Ltd, dated 14 November 2022. The first-of-type example was serial number 33052, registered ZK-GDK. The AS 33 is an all-composite single-seat competition glider with shoulder-mounted wing in 15m or 18m span fitted with flaps, winglets and speed brakes, a T-tail with retractable tailwheel, and water ballast tanks in the wings and tail. The powerplant unit can be fully retracted into the fuselage.

Type Acceptance Certificate Number 23/21B/9 was granted on 16 February 2023 to the Schleicher AS 33 Es based on validation of Type Certificate EASA.A.656. Specific applicability is limited to the coverage provided by the operating documentation supplied. There are no special requirements for import into New Zealand.

The AS 33 is a development of the ASW-27-18E (ASG29E), with some detail design refinements to the wing plan, aerofoil sections, wing/fuselage intersection and wingtips. The AS 33 Es is the sustainer version using the same retractable 2-stroke petrol engine installation which was previously used on the ASG29E.

The AS 33 Es was the first glider to go through the new EASA two-step certification process, whereby a type certificate is issued with some deviations. Aircraft are then able to be delivered with a Form 52 for use by experienced pilots, and the non-compliances are mitigated by some restrictions and limitations on the operation and airworthiness limitations. Subsequently full compliance with the design standard was achieved through a Major Change (See Technical Note No.1). Previously EASA used to allow pre-TC aircraft to operate on a Permit to Fly for Purpose 13 (Record breaking, air racing or similar competition). Similarly pre-certification aircraft in New Zealand were allowed to fly on a Special Limited airworthiness certificate.

4. NZCAR §21.43 Data Requirements

The type data requirements of NZCAR Part 21B Para §21.43 have been satisfied by supply of the following documents, or were already held by the CAA:

(1) State-of-Design Type certificate:

EASA Type Certificate Number EASA.A.656

Type Certificate Data Sheet number EASA.A.656 at Issue 04 dated 30 Nov 2021
– Model AS 33 Es approved 25 September 2020

EASA Major Change Approval 10075810 – Design Change AS 33 6ÄM01 –
Approval of full flight envelope; Removal of Deviation DEV-B22.335-01 and its
limitations; Modification of fuel system; Change to air brakes.

(2) Airworthiness design requirements:

(i) *Airworthiness Design Standards:*

The certification basis of the AS 33 Es is the Certification Specification for Sailplanes and Powered Sailplanes CS 22, Amendment 2, effective on March 5, 2009. This is an acceptable certification basis in accordance with CAR Part 21B paragraph §21.41 and Appendix C(a)(2), as CS 22 is an equivalent standard for Sailplanes and Powered Sailplanes under Advisory Circular 21-1 Appendix 3. There are no non-compliances and no additional special conditions have been prescribed by the Director under §21.23.

(ii) *Special Conditions:*

Nil

(iii) *Equivalent Level of Safety Findings:*

CS 22.331 (d)(2) – Pitching Moment – The design standard requires that a pitching moment coefficient C_{mo} of at least ± 0.025 must be used for the wing even if the actual coefficient of the airfoil is less. Schleicher were permitted to use the actual coefficient because this creates higher loads for the wing, so the load calculation is conservative.

CS 22.335 (f) – Design Maximum Speed V_D – V_D was calculated in accordance with OSTIVAS Issue July 1997, paragraph 3.246 Design Diving Speed V_D .

CS 22.585 (a) – Strength of Launching Hook Attachment – Q_{nom} is reduced by the factor 1.2 on the condition only textile ropes are used. (See Flight Manual §2.13. The tow rope must be a textile rope between 40 m (130 ft) and 60 m (200 ft) in length.)

(iv) *Airworthiness Limitations:*

See Maintenance Manual Section 4

(3) Aircraft Noise and Engine Emission Standards:

(i) *Environmental Standard:*

There are no noise requirements for self-sustaining powered gliders.

(ii) *Compliance Listing:*

Nil

(4) Certification Compliance Listing:

CRI A-1 EASA Type Certification Basis – Model AS 33 Es – Rev. 04 08-Dec-2022

Consultation Paper DEV-B22.335-01 – Deviation from CS 22 requirements related to flutter and Vd – This deviation mitigates through operational limitations the non-compliance to CS-22 related to the design maximum speed, flutter and in particular due to non-complete ground vibration test. The deviation will be removed from the certification basis through a major change as a post TC action.

ADOA AP.138 Compliance Checklist – AS 33 Es Initial Type Certification

ADOA AP.138 Compliance Checklist – AS 33 Es AM 01: Post-TC Actions

ADOA AP.138 Compliance Checklist – AS 33 Es AM 02: 15m Outer Wings

(5) Flight Manual: EASA-Approved Flight Manual for the self-sustaining powered sailplane AS 33 Es – CAA Accepted as AIR 3505

(6) Operating Data for Aircraft:

(i) *Maintenance Manual:*

Maintenance Manual for the self-sustaining powered sailplane AS 33 Es

(ii) *Current service Information:*

Technical Notes

(iii) *Illustrated Parts Catalogue:*

Not produced

(7) Agreement from manufacturer to supply updates of data in (5), and (6):

CAA 2171 from Schleicher Head of Quality Assurance dated 25 Nov 2022

(8) Other information:

Nil

5. New Zealand Operational Rule Compliance

Compliance with the retrospective airworthiness requirements of NZCAR Part 26 has been assessed as they are a prerequisite for the grant of an airworthiness certificate.

CAR Part 26 – Subpart B – Additional Airworthiness Requirements

Appendix B – All Aircraft

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
B.1	Marking of Doors and Emergency Exits	<i>To be determined on an individual aircraft basis</i>
B.2	Crew Protection Requirements – CAM 8 Appdx. B # .35	Not Applicable – Agricultural Aircraft only

Compliance with the following additional NZ operating requirements has been reviewed and were found to be covered by either the original certification requirements or the basic build standard of the aircraft, except as noted:

CAR Part 91 – Subpart F – Instrument and Equipment Requirements

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
91.505	Shoulder Harness if Aerobatic; >10 pax; Flight Training	Four-piece seatbelt harness fitted – See Flight Manual §7.5
91.507	Pax Information Signs – Smoking, safety belts fastened	Not Applicable – Single-seat glider
91.509	Minimum Instruments and Equipment	Not Applicable – Powered aircraft only
91.511	Night VFR Instruments and Equipment	Not Applicable – Certificated for Day VFR flight only
91.513	VFR Communication Equipment	<i>Operational requirement – compliance as applicable</i>
91.517	IFR Instruments and Equipment	Not Applicable – Certificated for Day VFR flight only
91.519	IFR Communication and Navigation Equipment	Not Applicable – Certificated for Day VFR flight only
91.523	Emergency Equipment	N/A – Single-seat glider [Superseded by §104.101(5)]
91.529	ELT – TSO C91a after 1/4/97 (or replacement)	<i>Operational requirement – compliance as applicable</i>
91.531	Oxygen Indicators – Volume/Pressure/Delivery	<i>Operational requirement – compliance as applicable</i>
91.533	Oxygen for Non-Pressurised Aircraft	<i>Operational requirement – compliance as applicable</i>
	[Installation of an oxygen bottle is optional, but can be readily retrofitted – See FM §7.11]	
91.541	SSR Transponder and Altitude Reporting Equipment	<i>Operational requirement – compliance as applicable</i>
91.543	Altitude Alerting Device – Turbojet or Turbofan	Not Applicable – Certificated for Day VFR flight only
91.545	Assigned Altitude Indicator	Not Applicable – Certificated for Day VFR flight only
A.15	ELT Installation Requirements	<i>To be determined on an individual aircraft basis</i>

CAR Part 104 – Subpart C – Equipment and Maintenance Requirements

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
104.101	(1) Airspeed Indicator (2) Altimeter (Adjustable barometric pressure) (3) Magnetic Compass (4) Safety Harness for each seat (5) A First Aid Kit (6) For powered gliders – (i) Fuel gauge for each main fuel tank (ii) Oil Pressure Gauge or warning device (iii) A tachometer or engine governor light (7) For IMC flight – (i) A variometer (ii) Turn & Slip/Artificial Horizon (iii) Radio transceiver	Required as Minimum Equipment – See TCDS Section #A.III.3 Required as Minimum Equipment – See TCDS Section #A.III.3 Required as Minimum Equipment – See TCDS Section #A.III.3 Required as Minimum Equipment – See TCDS Section #A.III.3 <i>Operational requirement – compliance as applicable</i> Required as Minimum Equipment – See TCDS Section #A.III.3 Not Applicable – Two-stroke motor Required as Minimum Equipment – See TCDS Section #A.III.3 } Not Applicable. Cloud flying is not permitted in the AS 33 Es }

NOTES: 1. A Design Rule reference in the Means of Compliance column indicates the Design Rule was directly equivalent to the CAR requirement, and compliance is achieved for the basic aircraft type design by certification against the original Design Rule.

2. The CAR Compliance Tables above were correct at the time of issue of the Type Acceptance Report. The Rules may have changed since that date and should be checked individually.

Attachments

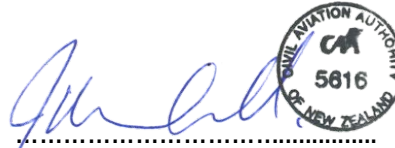
The following documents form attachments to this report:

Copy of Type Certificate Data Sheet Number EASA.A.656

Sign off

A blue ink signature of David Gill is written over a circular official seal of the Civil Aviation Authority of New Zealand. The seal contains the text 'CIVIL AVIATION AUTHORITY OF NEW ZEALAND' and the number '6853'.

.....
David Gill
Team Leader Aircraft Inspection

A blue ink signature of John Marshall is written over a circular official seal of the Civil Aviation Authority of New Zealand. The seal contains the text 'CIVIL AVIATION AUTHORITY OF NEW ZEALAND' and the number '5816'.

.....
Checked – John Marshall
Airworthiness Inspector

Appendix 1

List of Type Accepted Variants:

<i>Model:</i>	<i>Applicant:</i>	<i>CAA Work Request:</i>	<i>Date Granted:</i>
AS 33 Es	Sailplane Services 2005 Ltd	23/21B/9	16 February 2023

Appendix 2

Three-view drawing Schleicher AS 33 Es:

