Type Acceptance Report

TAR 97/03 – Revision 1

SCHLEICHER ASW 27 Series

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Executive Summary

New Zealand Type Acceptance has been granted to the ASW 27 Series based on validation of EASA Type Certificate number A.220. There are no special requirements for import.

Applicability is currently limited to the Models and/or serial numbers detailed in Appendix 1, which are now eligible for the issue of an Airworthiness Certificate in the Standard Category in accordance with NZCAR §21.177, 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).

1. Introduction

This report details the basis on which Type Acceptance Certificate No.97/03 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.

2. ICAO Type Certificate Details

Manufacturer:	Alexander Schleicher GmbH & Co
Type Certificate:	A.220
Issued by:	European Aviation Safety Agency
Model:	ASW 27
MCTOW	500 kg [1102 lb.]
Max. No. of Seats:	1
Noise Standard:	Not Applicable
Model:	ASW 27-18E
MCTOW	600 kg [1323 lb.] – With 18.0 m span wingtips 550 kg [1212 lb.] – With 15.0 m span wingtips
Noise Standard:	Not Applicable (sustainer engine only)

Engine:	Solo Type 2350	
	Type Certificate:	LBA-Datasheet No. 4603
	Issued by:	Luftfahrt-Bundesamt
Propeller:	AS2F1-2/L120-43-N2	
	Type Certificate:	EASA.P.004
	Issued by:	European Aviation Safety Agency

3. Type Acceptance Details

The application for New Zealand type acceptance of the ASW 27 was from the importer, Mr I H Finlayson, dated 2 April 1997. The first-of-type example was serial number 27025, registered ZK-GZO. The ASW 27 is a single-seat all-composite-construction glider with mid mounted wing, T-tail and provision for water ballast, intended for the FAI 15m class.

Type Acceptance Certificate No. 97/03 was granted on 15 May 1997 to the Schleicher ASW 27 based on validation of LBA Type Certificate 389. Specific applicability is limited to the coverage provided by the operating documentation supplied. There are no special requirements for import into New Zealand.

This report was raised to Revision One to include the ASW 27-18E powered variant of the latest extended span version, which is marketed commercially as the ASG29. It also notes the change in type certificate responsibility. The applicant was the importer Mr Ross Biggar, and the first-of-type example was serial number 29527, registered ZK-GRB. (This early-production aircraft was imported prior to completion of type certification, and was operated temporarily in the Special Experimental Category.) Type acceptance of the Model ASW 27-18E was granted on 16 December 2008.

The ASW 27-18 is a variant of the ASW 27 competition glider with extended wingspan for the FAI 18-metre class. The glider can be fitted with different outer wing panels to obtain either 15m or 18m span configuration. The ASW 27-18E is the powered version fitted with a 20 hp two-stroke Solo sustainer engine, and two-blade fixed-pitch composite propeller.

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) ICAO Type certificate:

EASA Type Certificate Number A.220

EASA Type Certificate Data Sheet no. A.220 at Issue 02 dated 20 February 2008
– Model ASW 27 approved 21 January 1997
– Model ASW 27-18 E approved 20 February 2008

LBA Type Certificate 389 and translation of type certificate data sheet (superseded)

(2) Airworthiness design requirements:

(i) Airworthiness Design Standards:
The certification basis of the ASW 27 is JAR 22 Change 4, 27 June 1989, including Amendments 22/90/1, 22/91/1 and 22/92/1, plus compliance with the Standards for Structural Substantiation of Glass and Carbon Fibre Reinforced Plastic Components for Sailplanes and Powered Sailplanes dated May 1986. For the models ASW 27-18/E this was updated to JAR 22 Amendment 6, 1 August 2001, and the Standards for composite construction dated July 1991. This is an acceptable certification basis in accordance with NZCAR Part 21B Para §21.41, as JAR 22 is the basic design standard for Gliders called up under Part 21 Appendix C and Advisory Circular 21-1. There are no non-compliances and no additional special conditions have been prescribed by the Director under §21.23. The ASW 27 Series is approved for Day VFR operations, and cloud flying without water ballast.

(ii) Special Conditions:
Nil

(iii) Equivalent Level of Safety Findings:
ASW 27 Series:
JAR 22.335(f) Design Air Speeds – The use of C_{Dmin} leads to an unrealistic high V_D (Design Maximum Speed). An iterative method determining actual C_D from calculated C_L was used to account for the fact that at least at 200 km/hr the lower end of the laminar bucket is reached.

ASW 27-18E Only:
JAR 22.207(c) Stall Warning – Due to non-linear variation of IAS and CAS near the stall the required stall warning margin between 1.05 and 1.1 V_{S1} cannot be exactly shown. The provision of CS22 was used as an alternative which permits a stall warning period of between 2 and 5 seconds when the control column is moved corresponding to a 2 km/hr per second speed reduction.

(iv) Exemptions:
ASW 27 Only:
JAR 22.697(c)(2) Air Brake Controls – It was not possible to retract the air brakes at V_A with a hand force less than 20 daN. However it was agreed through the JAR Study Group that this limitation only need be applied up to V_T (Design aerotow speed) but not less than 1.8 V_{si}. (This provision has now been incorporated into CS 22.)

(v) Airworthiness Limitations:
See Maintenance Manual Section 4.3.

(3) Aircraft Noise and Engine Emission Standards:

(i) Environmental Standard:
Not Applicable.

(4) Certification Compliance Listing:

Compliance Checklist ASW 27

Compliance Checklist ASW 27-18 E

(5) Flight Manual: LBA-Approved Flight Manual for the Sailplane Model ASW 27
CAA Accepted as AIR 2583

EASA-Approved Flight Manual for the self-sustaining powered sailplane ASW 27-18E – CAA Accepted as AIR 3079

(6) Operating Data for Aircraft, Engine and Propeller:

(i) Maintenance Manual:
Schleicher ASW 27 Maintenance and Repair Manual

Maintenance Manual – self-sustaining powered sailplane ASW 27-18E "ASG 29 E"

Manual for the Engine SOLO Type 2350
Control Instructions for Engine SOLO 2 350 after 5 years of operations

Operating and Maintenance Manual for the Propeller AS2F1

(ii) Current service Information:
Technical Notes ASW 27

(iii) Illustrated Parts Catalogue:
Not produced. (Schleicher supplied a copy of the Drawing List for the ASW 27)

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

CAA 2171 Form from E Kremer, Director, dated 9 April 1997 (ASW 27)
CAA 2171 Form from M Greiner, dated 4 December 2008 (ASW 27-18E)

5. Additional New Zealand Requirements

Compliance with the retrospective airworthiness requirements of NZCAR Part 26 is a prerequisite for the grant of a type acceptance certificate.

Civil Aviation Rules Part 26

Subpart B – Additional Airworthiness Requirements

Appendix B – All Aircraft

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
B.1	Marking of Doors and Emergency Exits	***To be determined on an individual aircraft basis***
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:

Civil Aviation Rules Part 91

Subpart F – Instrument and Equipment Requirements

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
91.505	Shoulder Harness if Aerobatic; >10 pax; Flight Training	JAR 22.1307 – Required Equipment – See TCDS §*.III.3
91.507	Pax Information Signs - Smoking, safety belts fastened	Not Applicable – Single-seat glider
91.509	Minimum Instruments and Equipment	Not Applicable – Powered glider
91.511	Night VFR Instruments and Equipment	Not Applicable – Certificated for Day VFR flight only
91.513	VFR Communication Equipment	***Operational requirement – compliance as applicable***
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) Appendix A.15 – Installation Requirements	***To be determined on an individual aircraft basis*** Maintenance Manual Section 2.11 addresses locations
91.531	Oxygen Indicators - Volume/Pressure/Delivery	Optional factory oxygen provisions – See Flight Manual §7.11
91.533	Oxygen for Non-Pressurised Aircraft For flight >30 min above FL100 – Supplemental for crew	***Operational requirement – compliance as applicable***
91.541	SSR Transponder and Altitude Reporting Equipment	***Operational requirement – compliance as applicable***
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	***To be determined on an individual aircraft basis***

Civil Aviation Rules Part 104

Subpart C - Equipment and Maintenance Requirements

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
104.101	(1) Airspeed Indicator	Required as Minimum Equipment – See TCDS Section #*.III.3
	(2) Altimeter (Adjustable for barometric pressure)	Required as Minimum Equipment – See TCDS Section #*.III.3
	(3) Magnetic Compass	***To be determined on an individual aircraft basis***
	(4) Safety Harness for each seat	Required as Minimum Equipment – See TCDS Section #*.III.3
	(5) A First Aid Kit	***To be determined on an individual aircraft basis***
	(6) For powered gliders –	(ASW 27-18E)
	(i) Fuel gauge for each main fuel tank	Displayed by (required) MCU 29E Powerplant Instrument
	(ii) Oil Pressure Gauge or warning device	Not Applicable – Two-Stroke engine
	(iii) A tachometer or engine governor light	Displayed by (required) MCU 29E Powerplant Instrument
	(7) For IMC flight –	
	(i) A variometer	⎡ Required for IMC (Cloud) Flight – See FM Section 2 Limitations
	(ii) Turn & Slip/Artificial Horizon	⎦
	(iii) Radio transceiver	***Operational requirement – compliance as applicable***

Attachments

The following documents form attachments to this report:

Photographs first-of-type example ASW 27 serial number 27025 ZK-GZO
Three-view drawings Alexander Schleicher Model ASW 27 and ASW 27-18E
Copy of EASA Type Certificate Data Sheet number EASA.A.220

Sign off

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David Gill	Checked – Peter Gill
Team Leader Airworthiness	Airworthiness Engineer

Appendix 1

List of Type Accepted Variants:

Model:	*Applicant:*	*CAA Work Request:*	*Date Granted:*
ASW 27	I H Finlayson	97/21B/03	15 May 1997
ASW 27-18E	R G Biggar	9/21B/11	16 December 2008