

# Civil Aviation Office

## Civil Aircraft Inspection Board

<b>BG - 163/1</b>
<b>SZD-55-1</b>
<b>SZD-55-1XM</b>
<b>Issue 4</b>
<b>March 15, 2004</b>

## TYPE CERTIFICATE DATA SHEET

to Type Certificate No BG-163/1, of 25.03.2002

This Data Sheet constitutes the part of the Type Certificate No BG-163/1. It contains basic technical data, and defines operation conditions and limitations within which the glider, for which this document has been issued, complies with airworthiness requirements referred to in certification basis.

### A

- 1. Glider model:** SZD-55-1, SZD-55-1XM
- 2. Designer:** Przedsiębiorstwo Doswiadczalno- Produkcyjne Szybownictwa "PZL-Bielsko"  
43-300 Bielsko-Biala, ul. Cieszyńska 325
- 3. Type Certificate holder:** Allstar PZL Glider Sp. z o.o.  
43-300 Bielsko-Biala, ul. Cieszyńska 325
- 4. Base for operation allowance:** Type Certificate No **BG-163/1**  
of 25.03.2002
- 5. Glider Category:** Utility „U”
- 6. General description:** SZD-55-1 (SZD-55-1XM) is a single seat performance sailplane of Standard Class. All composite, glass-epoxy structure. Mid wing, with „T”-tail arrangement. Two-panel, tapered wing with characteristic wing tip of elliptically curved leading edge. Wing airfoil NN-27. Sailplane equipped with water ballast tanks provided in wings and in the tail. One way landing gear with retractable main wheel (350mm diameter) and tail wheel (200mm diameter).  
Air brake extending on upper wing surface only.  
One, or two towing hooks can be installed on this sailplane:  
C.G. hook – on the landing gear leg and nose hook – on the bottom of fuselage, near to control column. Rudder mass balanced.

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**7. Modification of SZD-55-1XM in reference to SZD-55-1:**

On the Fact. No 551198105XM SZD-55-1XM sailplane, the following modifications have been made in reference to serial plane:

- water ballast wing tank divided into the inboard-, and outboard portion with a rib. In the partitioning rib, a valve is provided, operated „on-ground” only.
- aileron control system in a wing:  
modified design of aileron actuating levers and guides of these, design of push-rod guide and design of aileron outboard hinge.
- main landing gear: modified design of landing gear rear leg, with rubber shock absorbers introduced
- shape of seat cushion modified.

**B****8. Dimensions:**

span	15.00	[m]
length	6.85	[m]
height	1.47	[m]
wing area	9.6	[m <sup>2</sup> ]
horizontal tailplane area	1.017	[m <sup>2</sup> ]
vertical tailplane area	1.094	[m <sup>2</sup> ]
Mean Aerodynamic Chord (MAC)	0.6874	[m]
Root Chord (RC)	0.84	[m]

**9. Standard equipment:**

- airspeed indicator with stall warning device	LUN 1107-8
- altimeter	W-10S or W-12S
- variometer	WRs-5D
- variometer	WRs-30C
- turn indicator	EZS-3 or EZS-4
- compass	KI-13A or BS-1
- variometer compensation bottle	KWEC-2
- nose towing hooks	TOST E85
- C.G. towing hook	TOST G88
- complete set of safety harness	J5-00-00
- seat cushion	

**NOTES:**

The SZD-55-1XM glider may be equipped alternatively with PR-400 airspeed indicator with SP3 stall warning unit.

The glider may be equipped with C.G. tow hook (installed on landing gear), with nose tow hook (in front of control column) or with both a.m. hooks.

**C****10. Mass [kg]:**

maximum in-flight allowed sailplane mass	
- without water ballast	350
- with water ballast	500
minimum wing mass	102
minimum cockpit load <sup>2)</sup>	60
maximum cockpit load	110
maximum water ballast in wing tanks	195
maximum water ballast in fuselage tail tank	9.6

Maximum fuselage load is determined individually for each plane, basing on results of sailplane weighing with standard equipment, and given in Flight Manual item 2.4 "Table of weighing" of the SZD-55-1 or SZD-55-1XM sailplane.

Pilots of weight below 60 kg, must use the corrective ballast as specified in Flight Manual of the SZD-55-1 or SZD-55-1XM sailplane.

**11. Center of Gravity position:**

The allowed range of C.G. positions of empty sailplane with standard equipment depends on the mass of empty plane and, it is specified in diagrams in Flight Manual item 2.3. of the SZD-55-1 or SZD-55-1XM sailplane.

The allowed range of in-flight sailplane C.G. position:

- front limit	28.31 [cm]	(19.0 %MAC)
- rear limit	44.12 [cm]	(42.0 %MAC)

C.G. position is measured in respect to Datum Point. Datum Point is the leading edge at the wing/fuselage partition plane. The leading edge of MAC is 15.25 cm aft in reference to Datum Point.

The weighing is to be performed at such glider attitude that the leading edge and trailing edge, of the wing cross-section at the levelling point, are level.

Information on the allowed sailplane load and its distribution, ensuring that the allowed in-flight weight and C.G. position will be maintained, are contained in the Flight Manual of SZD-55-1 or SZD-55-1XM glider, item 2.3.

When determining the allowed load conditions, the crew with back parachute has been assumed. While flying without the parachute, pilot shall use the back cushion of 8 cm thickness. When using parachute of thickness different from 8.0 cm, the cushion thickness should be corrected appropriately.

**12. Airspeed limitations (EAS):**

[km/h]

never exceed speed	V <sub>NE</sub>	250
manoeuvring speed	V <sub>A</sub>	195

maximum rough air speed	$V_{RA}$	195
maximum allowed speed for air brake operation		250
maximum allowed landing gear operation speed	$V_{LO}$	250
maximum allowed winch launching speed <sup>4)</sup>	$V_W$	145
maximum allowed aerotow speed	$V_T$	155

**13. Cross wind component verified in take-off and landing:** 5 [m/s]

**14. Limit manoeuvring load factors:**

- at  $V_A$  speed +5.3 g
- at  $V_G$  speed -2.65 g
- at  $V_{NE}$  speed +4.7 g

**15. Allowed aerobatic manoeuvres and recommended entry speeds:**

manoeuvre	speed [km/h]	manoeuvre	speed [km/h]
normal loop	160÷180	climbing turn	180÷195
stall turn	160÷180	lazy eight	170÷185
half roll half loop	90÷100	spin	

NOTE: Aerobatics allowed only without water ballast (wing and fuselage tanks)

**16. Safety link:**

While aerotowed or winch-launched, the safety link shall be used of 600±50 [daN] rated strength, according to the dwg No 551.04.05, or other approved safety link with rated strength not exceeding 650.0 [daN].

**17. Other limitations:**

- night flying not allowed
- flights with water ballast at temperature below 273°K (0°C)
- winch-launched take-off allowed only with C.G. hook installed on landing gear

**18. Control surface deflection:**

- a) elevator
  - up  $30^{\circ} \pm 1^{\circ}$
  - down  $20^{\circ} \pm 1^{\circ}$
- b) rudder
  - right  $35^{\circ} - 3^{\circ}$
  - left  $35^{\circ} - 3^{\circ}$
- c) aileron
  - up  $31.5^{\circ} \pm 1^{\circ}$
  - down  $14.5^{\circ} \pm 1^{\circ}$

Aileron up and down deflections measured in reference to the neutral position.

At this setting neutral setting both ailerons deflected symmetrically down  $2.5^{\circ}$

- d) air brake 180.0 [mm] ± 3 [mm]  
(measured in reference to wing top surface)



**19. Certification basis:**

JAR-22 requirements , Change 4, issue of 7 May, 1987

**20. Manuals:**

SZD-55-1	SZD-55-1XM
- Flight Manual of SZD-55-1 sailplane	- Flight Manual of SZD-55-1XM sailplane
- Technical Description, Technical Service Manual, Periodic Works of SZD-55-1 sailplane, issue IV, August 1991	- Technical Description, Technical Service Manual, Periodic Works of SZD-55-1XM sailplane, issue I, July 1998
- Repair Manual of SZD-55-1 sailplane, issue II, 1991	- Repair Manual of SZD-55-1 sailplane, issue II, 1991

**E**

**21. The external surfaces of sailplane should have the white, not getting yellow, painting coats**

**22. The colour markings on upper surfaces of wing and tailplane not allowed.**

**23. Fact. Nos of planes covered with this Data Sheet:**

551190001 ÷ 551199110,

X-146 <sup>1)</sup>

X-144 with wings from X-145 <sup>2)</sup>

551194072 with wings from X-144 <sup>3)</sup>

51198105XM

from 551A04001 on

**NOTES:**

- For the sake of minor differences in construction, the appropriate corrections must be made in the manuals referred to in item 20 of this Data Sheet, and intended for the Fact. No X-146 glider.
- For the sake of minor differences in construction, the Fact. No X-144 glider may be operated only in accordance with the following manuals:
  - Flight Manual of the SZD-55-1 sailplane, issue 3/144 of 27.04.90
  - Technical Description, Technical Service Manual of the SZD-55-1 sailplane, issue III/144, of 07.05.1990
- For the sake of minor differences in construction, the Fact. No 551194072 glider may be operated only in accordance with the following manuals:
  - Flughandbuch SZD-55-1 Werk Nr 551194072, Ausgabe IV, November 1991, LBA Version
  - Wartungshandbuch SZD-55-1 Werk Nr 551194072, Ausgabe IV, August 1991, LBA Version

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