ASH 26 E
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The ASH 26 E is a self-launching powered sailplane with 18 m span. The sailplane version ASH 26 has got preparations to enable a retrofitting of the engine unit at a later stage without large expenditure. The roomy safety cockpit designed according to latest research results in the field of safety and accident protection, offers all modern comforts and ease of operation, even for tall pilots. The rubber-shock-mounted, retractable landing gear with hydraulic disc brake, the in flight adjustable back rest, the upwards hinging instrument binnacle and the speed trim, are only some of the many available conveniences.

The high performance wing airfoil with boundary layer control by means of turbulator holes, combined with an outstanding construction quality, imparts to the ASH 26 E flight performances that have so far been reserved to the Open Class gliders. Due to the high construction quality of the wing and to the sealing for the control surface gaps it has been possible to build a series production wing with a laminar airflow of 95 % along the profile underside. The sophisticated control linkage system gives very good manoeuvrability and harmless flight characteristics, even in landing approach. Additionally, the ASH 26 E can be equipped with 0.45 m high winglets.

The new, compact power-plant conception by SCHLEICHER, using a 37 kW (50 HP) strong single rotor engine makes the ASH 26 E a powerful a self-launcher with excellent climb rate. The advantages of the rotary engine regarding smooth running and low vibrations are very effective not only with full throttle but also in the low performance range. This engine unit stands out for simple operation, very low noise emission also in the cockpit, quick assembly and re-assembly, as well as low fuel consumption.

18 m: design successfully confirmed by the market and by the FAI

There was already a large demand for 15 m sailplanes with plug-in-wingtips. Those pilots who fly not only in competitions, have ordered their racing class sailplanes from the beginning with plug-in wing tips. Off the many ASW 20 orders at least a percentage of about 35 % were supplied ex factory with the larger span, retrofitted plug-in tips have not been included in this number.

More than 200 ASH 26 E so far sold have proven that it was the right decision to go for the 18 m span design.

In March 1997 the FAI decided to create now also a Class of its own for this span.

18 m: The class for a self-launching sailplane

With this wing span the mass of a strong engine may be carried on board without cutting down the gliding performance. This meets the multiple request for more independence by the engine installation. We have applied new methods to develop a new conception for the engine unit. The smooth running of the engine produces remarkably less vibrations and thus contributes to its reliability and conveniences. The lower noise emission that is owing to the large exhaust silencer, is particularly important. For this kind of aircraft noise was a big problem in the past. The noise emission of the ASH 26 E is 62.4 dB(A) which is far below the values so far known (measurement according to ICAO Annex 16 Chapter 10).

Optimised to 18 m span

As SCHLEICHER had started parallel another new design, the ASW 27, for the 15 m racing class, the ASH 26 design could be optimised for the larger span - with no compromises. This provided a sailplane with well-balanced flight characteristics as these have been known in particular from all SCHLEICHER sailplanes. Despite more narrow flaps and ailerons the manoeuvrability is good and landing configuration enables short and steep final approaches as known from the ASW 20 and ASH 25.

Less can be more

New profiles offer performance that was so far reserved to the Open Class. Less wing span is in any case better in high speed flights and this certainly is not a new discovery. But together with the airfoil section this advantage has its effect already with the normal forwards flight speeds as per McCready. Very seldom pilots do actually fly at the speed of the best glide ratio. Very often most of us fly faster than that speed and then the performance advantage of the large span is dwindling away. The lower aspect ratio of the 18 m wing span provides necessarily less performance compared to the Open Class. However, this minus applies only up to about the speed of the best glide, on the other hand it is rewarded by a big plus in handling.

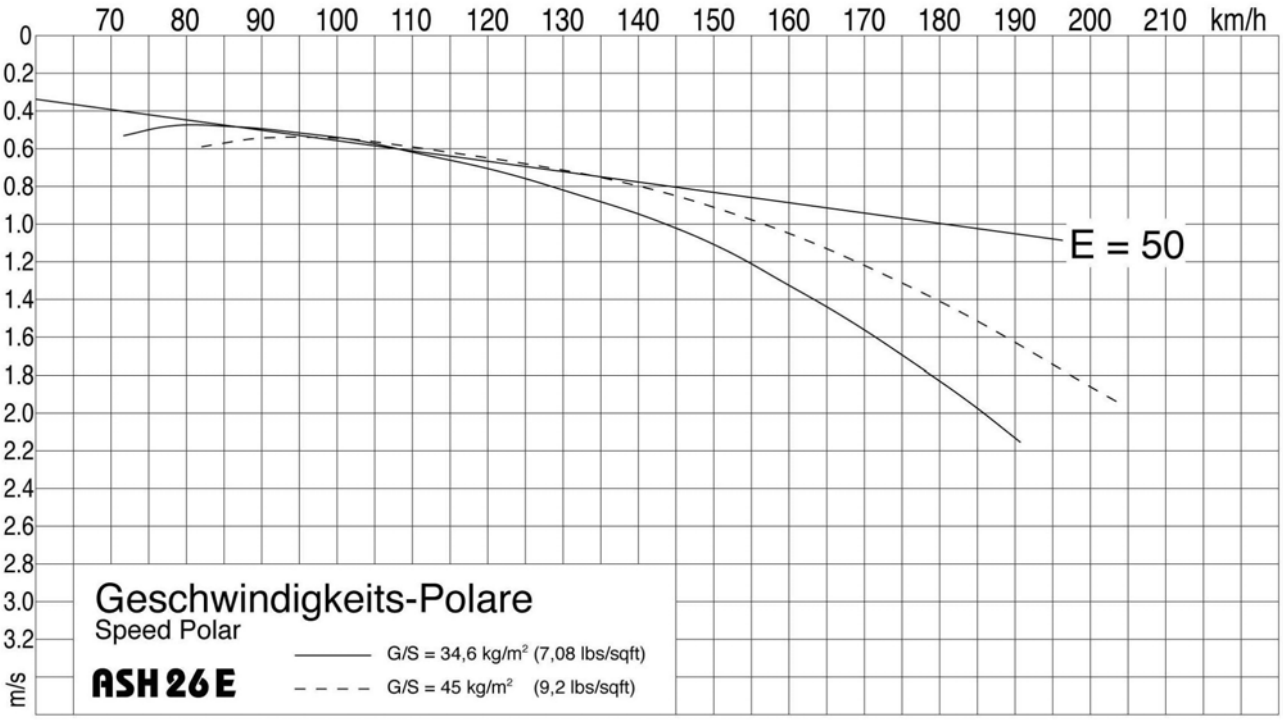
The ASH 26 E can be equipped with 0.45 m high winglets; these have been calculated according to latest wind tunnel results using the large-scale panel method. These winglets can be retrofitted also to any ASH 26 aircraft.

The Polar

The glide ratio is a performance criterion. But the curve of the entire polar is more decisive. The flatter this line moves along the glide ratio tangent, the wider the range in which the sailplane may be flown with good performance. For the given example of a wing loading of 34.6 kg the glide ratio for the speed range from 85 to 110 km/h is above 50. At the speed of 170 km/h this wing loading produces a sink of 1.55 m/s only. Owing to the good cooperation with the specialists for airfoil section, structure and flutter this aircraft discloses a new class even for the pure gliding.

A performance measurement with zig-zag tape applied to the airfoil underside showed that for this selected airfoil only a boundary layer control by means of blast turbulators will be suitable. The excellent values stated in the calculated polar thus could be confirmed.

The use of the NACA-ducts mod which was developed for the ASW 27, resulted in an even better low-drag supply of the blast turbulators by means of pressure air.



DESIGN SPECIFICATION

Glider, midwing configuration with T-tail, flaps, retractable landing gear and water ballast.

FUSELAGE

CRP / SRP (Kevlar) monocoque fuselage with roomy safety cockpit made from GRP. Rubber-shock-mounted, retractable landing gear with 5.00 x 5 tire, retraction mechanism has counter spring for ease of operation. Hydraulic disc brake which is connected to the airbrake lever. In flight adjustable rudder pedals and back rest. Optimum cockpit ventilation through intake in the fuselage nose with continuously adjustable outlets, one on the front canopy frame and the other through fresh air nozzle for the pilot. TOST C.G. tow release coupling and nose aero tow release coupling. Infinitely variable speed trim, lockable by a stick key.

CANOPY

The full-vision, gas-spring assisted canopy (on the left side with sliding window) is hinged at the front. Tongue and groove type sealing for the canopy frame.

INSTRUMENT PANEL

The instrument panel is made to hinge upwards with the canopy; even when the canopy is open, the instruments are still covered. When the canopy emergency jettison system is operated, the canopy together with the instrument panel coaming can be removed and the instruments are easily accessible.

WING

Cantilever, two-part wing with new developed laminar airfoil and boundary layer control. The wing surface is a sandwich of carbon fibre / plastics with a hard foam core; wing spars with carbon fibre flanges. Metal dive brakes on the upper wing side (airbrake paddles with spring-loaded caps). Wing assembly is straightforward with a conventional tongue and fork spar extension secured with cylindrical main pins. Optionally, 0.45 m high winglets at a separation joint at 8.7 m.

WATERBALLAST

Water ballast system with automatic connections. Easy maintenance because of removable water bags. Filling through two drain outlets under the wing. Ballast capacity: approx.. 2 x 72 kg or 2 x 30 kg.

TAILPLANE AND FLAPS

T-tail (elevator with stabilizer). Stabilizer in CRP-SRP-sandwich-construction. Vertical fin in GRP-SRP-sandwich construction because of the VHF-antenna radiation. All control surfaces & flaps are new-technology sandwiches of Aramid fibre / plastics with a hard foam core; which give extremely light and stiff control surfaces.

CONTROL CIRCUITS AND FITTINGS

Aileron, elevator, flaps, and airbrakes are actuated by pushrods running in anti-noise ball-bearings, and use automatic connections at the assembly joints. The actuating levers and bellcranks are fitted with ball bearings and precise uniball-joints. This provides the lowest possible actuating forces for the pilot and guarantees comfortable, non-fatiguing flying. The rudder is actuated by stainless steel cables. The fittings are welded steel and milled or turned Duraluminium respectively.

BOARD EQUIPMENT AND ACCESSORIES

Static pressure vents (for the A.S.I.) in the fuselage tail boom left and right. Pitot, static pressure and TE-compensation through 3-way-nozzle (multi-probe) in the fin. For the powered sailplane Pitot in the fuselage nose. VHF antenna in the fin. It will be possible to fix camera mountings at the canopy frame left & right.

POWER-PLANT

The development of a new conception for the power-plant has solved many of the so far known problems with retractable engine units. The foldable drive belt makes it possible to install the engine stationary in the fuselage. This has a particularly positive effect for the size of the exhaust silencer. Furthermore, it provides a better mounting bedding of all components of the power-plant. The entire power-plant can be removed after undoing three bolted connections. The C.G. of the power-plant is below the front mounting attachment point. Particularly in the case of a crash landing the pilot is well protected against the propeller tower.
Retrofitting the power-plant is possible for the sailplane, as engine doors, engine mounting points etc. are already installed in the airframe.

ENGINE

The 37 kW (50 HP) strong rotary engine with the designation AE50R was originally developed by the renowned British motorcycle manufacturer NORTON, and it is outstanding for its low power-to-weight ratio and its remarkable smooth running. The manufacturer has succeeded in solving typical "Wankel-type" problems. The seals are the latest state of the art technology and through the internal air cooling it was possible to solve the problem of the rotor overheat.

Engine data: Wankel rotary engine with single rotor and 294 ccm. With liquid cooled housing and interior forced air rotor cooling. Carburetted with dual electronic ignition, firing 2 plugs with electrical starting and 18 amp Generator.

Service Life: the engine is not subject to a time limit ! Contrary to conventional two-stroke engines no dismantling inspection is required after 6 years. If a detailed inspection (no dismantling of the engine) after 150 hours in operation reports no wear of the rotor seals and its faces, the engine can be operated for further 150 hours. Total service life is stated to be 1000 hours at the time being.

Since the end of 2000 the ASH 26 E is delivered with a propeller made by ourselves. The tuning of this propeller has been optimised to the performance characteristics of the power-plant; and particular attention has been laid to an even better take-off performance. On a grass runway the performance is improved by about 30 %, on a concrete runway it is 10-20 %. Furthermore, the best climb ratio is also improved. This mod can be retrofitted to any earlier serial numbers.

ASH 26 E

ENGINE PERFORMANCE

For msl and normal atmosphere at v_y = 95 km/h and a maximum take-off mass of 525 kg the climb rate is of 3.4 m/s. This is slightly higher than the rate which is normally achieved in aero tow and allows a powerful and safe self-launch. It should be pointed out that the ASH 26 E has no tendency to pitch down during ground roll at full throttle.

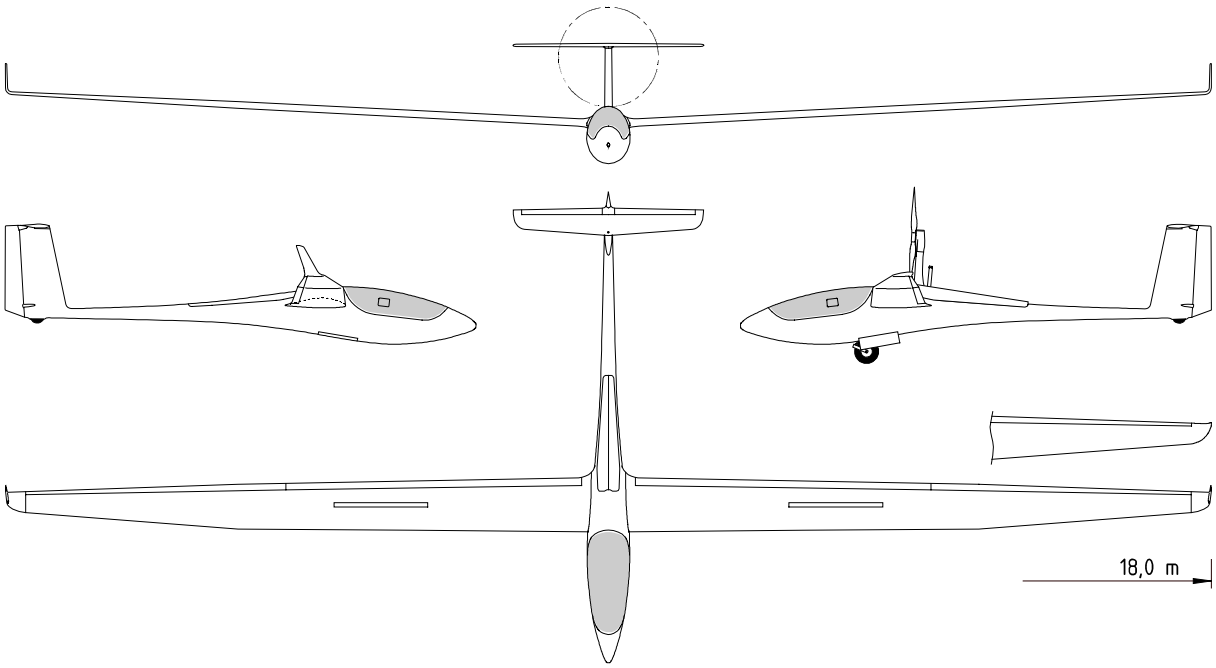
With a full fuselage tank (16 liters) the engine operation time at 6900 RPM is about one hour and 15 minutes. Maximum range in sawtooth flight under optimum conditions is about 680 km with a very low fuel consumption of 12.8 litres per hour. As an optional extra a flexible fuel tank with each 15 litres can be fitted into each wing, even as retrofit.

TECHNICAL DATA

			ASH 26 E		**ASH 26**	
Span	m	(ft)	18	(59.06)	18	(59.06)
Wing area	m²	(sqft)	11.68	(125.72)	11.68	(125.72)
Wing aspect ratio			27.74		27.74	
Fuselage length	m	(ft)	7.05	(23.13)	7.05	(23.13)
Cockpit height	m	(ft)	0.82	(2.69)	0.82	(2.69)
Cockpit width	m	(ft)	0.64	(2.09)	0.64	(2.09)
Height at tailplane	m	(ft)	1.51	(4.95)	1.51	(4.95)
Wing airfoil	m		DU 89-134/14		DU 89-134/14	
Winglet height	m		0.45		0.45	
Empty mass	kg	(lb)	approx. 360	(794)	approx. 270	(595)
Max. take-off mass	kg	(lb)	525	(1158)	525	(1158)
Mass of one wing	kg	(lb)	approx. 72	(158)	approx. 72	(158)
Max. wing loading	kg/m²	(lb/sqft)	45	(9.22)	45	(9.22)
Min. wing loading	kg/m²	(lb/sqft)	37	(7.58)	30	(6.14)
Waterballast, max.	l	(US gal)	100	(26.5)	155	(41)
Useful load, max.	kg	(lb)	110	(242.5)	110	(242.5)
Max. speed	km/h	(kts)	270	(146)	270	(146)
			For m = 405 kg flight mass (m=893 lbs):		For m =345 kg flight mass (m=761 lbs):	
Min. speed	km/h	(kts)	approx. 71	(38.3)	approx. 65.5	(35.3)
Min. sink	m/s	(ft/min)	approx. 0.48	(94.4)	approx. 0.44	(86.6)
Best glide ratio			> 50 at 96 km/h	(51.8 kts)	> 50 at 88 km/h	(47.4 kts)

Engine Unit:

Performance	kW	37 (50 HP) at 7500 RPM
Cubic capacity	cm³	294 (17.94 cubic inches)



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