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Denel Aircraft Rooivalk - Archived 11/2008

Outlook

- Denel abandoned development and marketing efforts in 2007
- Turkish selection of AgustaWestland's A129 over Rooivalk for attack helicopter requirement ended export hopes
- No further production forecast

Orientation

Description. Twin-engine combat support helicopter.

Sponsor. Initial development by South African Air Force through 1992; Denel continued subsequent development with in-house funds.

Status. Out of production.

Total Produced. Two prototype/demonstrator aircraft, one pre-production aircraft, 12 production-standard aircraft built through 2003.

Application. Gunship and combat support.

Price Range. Estimated at \$10.5 million in 2006 dollars.



Rooivalk

Source: Kentron

Denel Aircraft Rooivalk

Contractors

Prime

Denel Aviation	http://www.denel.co.za , PO Box 11, Kempton Park, 1620 South Africa, Tel: + 27 11 927 2726, Fax: + 27 11 927 2181, Email: info@aviation.denel.co.za , Prime
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Subcontractor

Turbomeca SA	http://www.turbomeca.com , Bordes, 64511 France, Tel: + 33 5 59 12 50 00, Fax: + 33 5 59 53 15 12 (Makila Turboshift Engine)
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Technical Data

Design Features. Twin turboshaft-powered helicopter reverse-engineered from Aerospatiale AS.330 Puma design. Composite rotor blades (four), with unspecified composite fuselage structure. Nose-mounted target acquisition turret and chin-mounted 20mm cannon, swept stub wings for stores/weapons carriage. Seats two crew in tandem.

	<u>Metric</u>	<u>U.S.</u>
Dimensions		
Length overall(a)	18.73 m	61.4 ft
Fuselage length	16.39 m	53.75 ft
Height overall	5.19 m	17 ft
Main rotor diameter	15.58 m	51.1 ft
Weight		
Empty	5,910 kg	13,029 lb
Max TOW	8,750 kg	19,290 lb
Typical mission TOW	7,500 kg	16,535 lb
Capacities		
Total internal fuel	1,854 liter	490 gal
Performance		
Max cruise speed	278 kmph	159 kt
Hover ceiling OGE, ISA at S/L	5,030 m	16,500 ft
Max climb rate, ISA at S/L	670 mpm	2,200 fpm
Service ceiling, ISA at S/L	6,100 m	20,000 ft
Propulsion		
Prototypes	(2)	Topaz (locally uprated Turbomeca Turmo IV) turboshafts, estimated at 1,104-1,181 kW (1,480-1,584 shp) each.
Production models	(2)	Turbomeca Makila 1A2 two-shaft, axial-centrifugal-flow turboshaft engines rated 1,374 kW (1,843 shp) each.

Seating

Two in tandem.

Armament

Kentron GA-1 20mm cannon mounted in steerable chin turret; a 30mm DEFA weapon may be fitted as an option. Two wingtip stations accommodate V3B Kukri or V3C Darter air-to-air missiles; four underwing hardpoints accommodate either 68mm unguided rocket launchers or Swift laser-guided anti-tank missiles.

(a) With rotors turning.

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Program Review

Background. Denel Aviation (formerly Atlas Aviation) began development of the XH-1 Alpha gunship testbed in March 1981 with South African Air Force (SAAF) funding. The testbed was a modified Aerospatiale Alouette III airframe, which was first flown in 1985. The following year a pair of XTP-1 demonstrators (modified Aerospatiale AS.330 Pumas) began flight testing, powered by uprated engines and incorporating a number of locally produced components.

Development of the current Rooivalk was begun in 1984 when the SAAF funded the XDM (experimental development model) under the designation XH-2. The aircraft, subsequently redesignated CSH-2, flew in 1990. The SAAF had intended to procure the gunship, but the cessation of hostilities in Namibia put an end to this requirement, and SAAF funding came to an end in 1992. By that time a second prototype/demonstrator had flown.

A third aircraft (preproduction version) flew in February 1997. This machine incorporated a number of design changes, perhaps most notably the switching of the pilot and weapons operator positions.

Into Production

At the end of 1993, Denel announced that it had begun cutting metal for the four SAAF aircraft on order; initial deliveries were made in 1998. The SAAF subsequently announced that it had ordered 12 units, but this figure included the original four.

Malaysian Interest

In 1995, Denel and Malaysia's Airod signed a preliminary agreement providing for the latter to market, assemble/produce, and support Rooivalks ordered by the Asian country's armed forces. The Royal Malaysian Air Force, which had a requirement for eight attack helicopters, has also looked at several other candidates. As an inducement, Denel also offered its Oryx helo, a much-modified Aerospatiale SA.330 Puma, to fill a 10-unit Malaysian requirement for logistical support helicopters. No further progress on a deal was ever reported.

Denel proposed the Rooivalk to a number of other nations without success. In mid-2007, the company announced that it was terminating further development and marketing efforts for the helicopter.

Timetable

Month	Year	Major Development
Mar	1981	Initial XH-1 Alpha development
Late	1984	Rooivalk design initiated
	1985	First flight of XH-1
	1986	First flight of XTP-1
Feb	1990	First flight of Rooivalk CSH-2
Early	1992	First flight of CSH-2 advanced demonstration model
	1992	SAAF funding terminated; unspecified funding provided
	1993	SAAF places four-unit order
	1993-94	Continued flight testing, marketing
	1994-95	Re-engining, airframe redesign
End	1998	Initial production deliveries
Early	2003	Initial SAAF order completed
Mid	2007	Denel announces that it is terminating development and marketing of the Rooivalk

Worldwide Distribution/Inventories

Operator	Designation	Quantity
South African Air Force	Rooivalk	11

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Forecast Rationale

The selection by the Turkish military of AgustaWestland's A129 Mangusta over Denel's Rooivalk to fill a long-standing requirement ended the hopes of the South African manufacturer that it could score a major export win. Aside from Turkey, no other potential customers for the Rooivalk have appeared in recent years.

The South African Air Force (SAAF) has only 11 aircraft in operation (a twelfth was written off in August 2005), and prospective customers can fairly question

whether the Rooivalk will get the assurance of long-term development and support that attack helicopters made by other manufacturers now receive as a matter of course.

Denel decided in mid-2007 to abandon its efforts to further develop and market the Rooivalk after losing the Turkish competition.

Other than providing maintenance and support to the 11 remaining SAAF aircraft, Denel's Rooivalk program has reached its end.

Ten-Year Outlook

No production forecast.

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