

# ARCHIVED REPORT

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## Airbus Helicopters AS 355

### Outlook

- Airbus Helicopters has dropped the AS 355 from its product line
- The company's newer H135 light twin has outsold the AS 355 in recent years

### Orientation

**Description.** Twin-turboshaft-powered multirole helicopter.

**Sponsor.** The AS 355 was sponsored by Aerospatiale.

**Status.** Production of the AS 355 appears to have ended.

**Total Produced.** Through 2016, approximately 815 AS 355/555 helicopters were produced.

**Application.** Passenger transportation, passenger charter, forestry and resource development, pollution control, maritime surveillance, fishery and border patrol, general police duties, emergency medical services, corporate transportation, and offshore oil and gas support.

**Price Range.** AS 355NP, estimated at \$3.92 million in 2015 U.S. dollars.



AS 355NP

Source: Airbus SE

**Airbus Helicopters AS 355****Contractors****Prime**

<b>Airbus Helicopters</b>	<a href="http://www.airbushelicopters.com">http://www.airbushelicopters.com</a> , Aeroport Int'l Marseille Provence, Marignane, France, Tel: + 33 4 42 85 85 85, Fax: + 33 4 42 85 85 00, Prime
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**Subcontractor**

<b>Safran Helicopter Engines (Turbomeca)</b>	<a href="http://www.safran-helicopter-engines.com">http://www.safran-helicopter-engines.com</a> , Avenue Joseph Szydlowski, Bordes, France, Tel: + 33 5 59 12 50 00, Fax: + 33 5 59 53 15 12 (Arrius 1A Turboshaft)
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Contractors are invited to submit updated information to Editor, International Contractors, Forecast International, 22 Commerce Road, Newtown, CT 06470, USA; rich.pettibone@forecast1.com

**Technical Data****(AS 355NP)**

	<u>Metric</u>	<u>U.S.</u>
<b>Dimensions</b>		
Length overall, rotors turning	12.94 m	42.45 ft
Fuselage length	10.93 m	35.86 ft
Height overall	3.14 m	10.30 ft
Main rotor diameter	10.69 m	35.07 ft
Main rotor blade chord	350 mm	13.78 in
Tail rotor diameter	1.86 m	6.10 ft
Tail rotor blade chord	205 mm	8.07 in
<b>Weight</b>		
Empty weight	1,503 kg	3,313 lb
Maximum sling load	1,134 kg	2,500 lb
Maximum takeoff weight	2,600 kg	5,732 lb
Maximum takeoff weight with external load	2,800 kg	6,172 lb
<b>Capacities</b>		
Standard usable fuel	730 liters	193 U.S. gal
Baggage compartment volume	1.0 cu m	35.3 cu ft
<b>Performance(a)</b>		
Maximum speed	278 km/h	150 kt
Maximum range with no reserves	731 km	395 nm
<b>Propulsion</b>		
AS 355NP	(2)	Safran Helicopter Engines Arrius 1A1 turboshaft engines rated 343 kW (460 shp) each for takeoff.

**Seating**

Standard seating for six (seven seats maximum).

(a) At maximum takeoff weight, SL, ISA, and zero wind conditions.

## Airbus Helicopters AS 355

### Variants/Upgrades

**AS 355E.** Initial production version. Powered by Allison 250-C20F engines.

**AS 355F.** In 1981, Aerospatiale replaced the AS 355E model with the improved AS 355F. The new variant featured main rotor blades of increased chord, twin-body servo command units, two electrical generators, an uprated transmission, and an improved hydraulic system.

**AS 355F1.** In January 1984, Aerospatiale began selling the uprated AS 355F1. This version differed from the F model in that it had increased takeoff weight, an improved rotor chord, new structural materials, and an increase in maximum power transmitted to the main gearbox.

**AS 355F2.** A heavier takeoff weight variant of the F1, the AS 355F2 was certificated in January 1986. It had a load compensator in the yaw channel and an extension of the CG limits, as well as longer operational life for elements such as the rotor mast and the main gearbox. Another version, the AS 355F2R, was introduced in 1990; it was powered by improved Allison 250-C20R turboshafts rated 460 shp each.

**AS 355N.** AS 355 variant powered by Turbomeca Arrius 1A engines. Also featured Full Authority Digital Engine Control (FADEC). The British company McAlpine Helicopters became the launch customer for this variant, placing an order in 1991.

**AS 355NP.** Most recent civil AS 355 variant. Compared with the AS 355N, the AS 355NP had enhanced Category A performance, allowing it to take off at maximum gross weight in various climatic conditions. Improved one engine inoperative (OEI) performance increased payload (an additional 120 kg in HOGE, ISA, SL conditions) for customers operating in conditions where performance on one engine was required.

Maximum takeoff weight with a sling load was increased by 200 kilograms (441 lb), to 2,800 kilograms (6,172 lb).

The AS 355NP was fitted with two Safran Helicopter Engines (formerly Turbomeca) Arrius 1A1 engines. On the Arrius 1A1, a new HP turbine had been integrated in order to increase emergency power for improved OEI performance. The AS 355NP also had a new main gearbox, which was derived from the AS 350B3 and provided 500 kW of mechanical power.

The AS 355NP was granted certification by the European Aviation Safety Agency (EASA) in February 2007.

**AS 555 Fennec.** Military variant of the AS 355. Later versions included the following:

**AS 555AN Fennec.** Armed military version. Powered by a pair of 340-kW (456-shp) Arrius 1A turboshaft engines. The French Air Force took delivery of more than 40 AS 555ANs.

Among the armament options for the AS 555AN were TDA or Forges de Zeebrugge rocket packs and a Giat M621 20mm cannon.

**AS 555SN Fennec.** Armed naval variant. Powered by Arrius 1A engines. The SN was capable of anti-submarine warfare and over-the-horizon targeting missions. Standard equipment included the Honeywell RDR-1500B radar, the Thales Nadir Mk 10 navigation system, and the SFIM 85 T31 autopilot. The SN could carry one homing torpedo.

**AS 555UN Fennec.** Unarmed military utility version. Powered by Arrius 1A engines.

### Program Review

**Background.** Aerospatiale Helicopter Division, now part of Airbus Helicopters, began development work on the AS 355 in 1978 and had flown two prototypes by the end of 1979. The French company had previously identified the need for a light twin, primarily for resource exploration and development tasks. Owner/operators of the single-turbine AS 350 also exerted a great deal of pressure on the company to develop a twin-engine variant of that helicopter.

The AS 355 was marketed in North America as the TwinStar while, in all other regions, it was sold as the Ecureuil 2. Unlike the AS 350, which was originally sold with two engine choices depending on geographic market area, the original AS 355 came only with Allison 250 engines. However, Eurocopter began delivering Turbomeca Arrius-powered AS 355s alongside Allison-equipped versions in 1992. Eventually, the AS 355 was available for sale only with Arrius engines.

## Airbus Helicopters AS 355

In January 2014, Eurocopter was renamed Airbus Helicopters.

**Design Details.** The AS 355 made use of the basic AS 350 airframe, but incorporated a reinforced fuselage and landing gear to accommodate the higher takeoff weight of the twin. The helicopter was powered by a pair of Turbomeca Arrius engines that were separated

by a firewall that enabled it to meet U.S. FAR Part 27, amendment 16, fire protection standards. The main transmission of the AS 350 was retained nearly intact on the AS 355, but its power capacity was raised. Another change from the AS 350 was an increased-thrust tail rotor.

## Timetable

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
Mid-	1978	Development work initiated
Sep	1979	First prototype flown
Nov	1979	Second prototype flown
Oct	1980	French VFR certification of AS 355E
Jan	1981	U.S. FAA VFR certification of AS 355E
Apr	1981	French VFR certification of AS 355F
Nov	1981	U.S. FAA VFR certification of AS 355F
Nov	1982	French IFR certification of AS 355F
Jan	1984	AS 355F1 becomes standard production aircraft
Apr	1984	FAA certification of AS 355F1
Dec	1985	AS 355F2 model certificated
Late	1986	Testing of Arrius-powered aircraft begun
Jun	1989	French certification of AS 355N
Feb	2007	EASA certification of AS 355NP
Jun	2007	Initial delivery of AS 355NP
	2016	Production ended

## Worldwide Distribution/Inventories

### Military/Government Operators

(as of May 2017)

Operator	Designation	Quantity
Algeria Air Force	AS 355N	10
Algeria Government	AS 355	2
Argentina Coast Guard	AS 355NP	2
Argentina Navy	AS 555	4
Australia Government	AS 355F1	1
Belarus Border Guard	AS 355NP	3
Benin Air Force	AS 355	1
Brazil Air Force	AS 355F2	5
Brazil Navy	AS 355F2	8
Chile Army	AS 355	1
Colombia Navy	AS 555	1
Djibouti Air Force	AS 355	1
France Air Force	AS 555	41
France Army	AS 555	17

**Airbus Helicopters AS 355**

Operator	Designation	Quantity
France Customs Service	AS 355F2	4
Malaysia Government	AS 355F2	2
Malaysia Government	AS 355N	9
Malaysia Navy	AS 555	6
Mauritius Police Air Wing	AS 555	1
Mexico Navy	AS 555	2
Morocco Police	AS 355F1	2
Senegal Air Force	AS 355F1	1
Sierra Leone Air Force	AS 355F	1
Spain Directorate General of Traffic	AS 355NP	16
Trinidad & Tobago Government	AS 355F2	1
United Kingdom Air Force	AS 355F1	2
Uruguay Navy	AS 355F2	1
Venezuela National Guard	AS 355F2	9

**Forecast Rationale**

Airbus Helicopters officially dropped the AS 355 from its product line in September 2015, though production of the light twin continued in order to fill remaining orders in the sales backlog. By the end of 2016, production of the helicopter appeared to have come to an end, though it is possible that some deliveries will overlap into 2017.

According to Airbus Helicopters, the decision to end AS 355 production was part of an effort to rationalize the company's product portfolio and concentrate on more popular models. The firm's newer H135 light twin

had been a much stronger seller than the AS 355 in recent years. Since 2010, annual production of the AS 355 had been in single digits.

The Indonesian Army has six AS 355NPs on order for use in the light attack role. The six helicopters appear to have been delivered to Indonesian Aerospace (IAe) by Airbus Helicopters in 2016. At its facilities in Indonesia, IAe will install various mission equipment on the helicopters, including machine guns and rocket launchers. The six helicopters are scheduled to be turned over to the Army by IAe in 2017.

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