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### **Alenia Aermacchi M-346**

The M-346 is the most Advanced/Lead-In Fighter Trainer currently produced and the only new generation trainer optimised for the role. Its excellent performance and flying qualities, close to modern frontline fighters, brings the M-346 to a superior teaching effectiveness level. The advanced design solutions provide also high safety standards and reduced acquisition and operational costs. The aircraft is tailored to train pilots to fly new generation combat aircraft and is well suited for every phase of advanced and pre-operational training, to reduce the flight hours on the more expensive frontline aircraft.

The aircraft embodies the latest “design-to-cost” and “design-to-maintain” concepts, with avionics modelled upon those of new generation military aircraft such as Eurofighter, Gripen, Rafale, F-16, F-18, F-22 and the future JSF.

Its flexible platform is configured also for the operational roles as an Affordable Advanced Defence Aircraft (AADA). The structural design already includes nine hard-points, allowing up to 3000 Kg of external stores to be carried. The M-346 is characterized also by provisions for the installation and integration of Helmet Mounted Display, Multi-mode Radars, Electronic Warfare System and tactical data link. The speed of the M-346, its ability to climb quickly and the extreme manoeuvrability make it a highly survivable aircraft. The low maintenance man hours per flight hour and efficiencies, offered by a trainer-based aircraft design, also make it a very cost effective option.

### **The M-346 is the ideal platform for the next generation Integrated Training Systems.**

In November 2009 the Italian Air Force signed the contract about the first batch of six M-346, including also simulators and integrated logistic supports, to fulfill the advanced/lead-in fighter training requirements for pilots that will fly the future generation combat aircraft. This contract forms part of a broader agreement to supply a total of 15 M-346 and related support.

In June 2011 the General Directorate for Aeronautical Armaments of the Italian Ministry of Defense issued the military type certificate for the M-346 trainer aircraft. This certification is a fundamental requirement for all aircraft to be operated in a military environment. At the beginning of January 2012, the first two M-346s (which has been designated T-346A) was delivered to the Flight Test Unit at the Pratica di Mare air base (Rome), where it undergoes operational tests.

At the end of September 2010 Alenia Aermacchi signed the first international contract with the Republic of Singapore within the Fighter Wings Course (FWC) Program, which is aimed to replace the current fleet of trainers. The consortium, comprising ST Aerospace (prime contractor) and Boeing, awarded the supplying of 12 M-346 aircraft and the Ground Base Training System. The delivery of the first aircraft is expected in 2012. Alenia Aermacchi has also finalised with ST Aerospace the logistics support contracts for the above mentioned fleet of M-346 trainers of the Republic of Singapore Air Force.

In February 2009 it was also selected by the United Arab Emirates for their new training air fleet and the negotiations are at the last stage for the acquisition of a complete Integrated Training Solution comprehensive of 48 M-346.

The industrial baseline M-346 (LRIP00) made its official first flight in July 2008, starting the industrialisation phase. The production process of the M-346 was designed to respond to the requirements of the programme in terms of capacity, cost and quality, together with extensive innovative features. The production line has been completely conceived and designed by Alenia Aermacchi to achieve the rate of 24 aircraft per year, with the capacity to reach the produce up to 48 a/c without any other additional investments.

The M-346 features innovative design solutions. Vortex lift aerodynamics, together with the full authority quadruplex Fly-by-Wire control system, allow the aircraft to remain fully controllable at angles of attack over 35° degrees. With this technological achievement, Alenia Aermacchi confirms it can autonomously design and manufacture advanced aircraft with Fly-by-Wire flight controls system. This, combined with the twin-engine configuration and thrust/weight ration close to 1, translates into safety levels unattainable by its competitors.

The M-346 also integrates digital avionics with the ability to simulate sensors and threats in flight (Embedded Tactical Simulation). These characteristics and its performance make the M-346 the world's leading tactical pre-operational training aircraft.

The aircraft is equipped with an in-flight refuelling probe to assess the related operational capability.

The M-346 programme also involves other Finmeccanica Group companies including SELEX Galileo, Sirio Panel and SELEX Elsag.

The **Alenia Aermacchi Integrated Training System** provides, together with the aircraft, a Ground Based Training System (GBTS) harmonised within the training philosophy and enabling the Student pilot to learn and rehearse the entire aircraft syllabus and training objectives on the ground.

The M-346 baseline Ground Based Training System of Alenia Aermacchi includes: Academic Training System, Simulation Based Training, Flight Training Device, Full Mission Simulator.

Enlarging the scope to the overall ITS, Mission Support System and Training Management Information System are also available.

Related to the internationalization of the M-346 programme, Alenia Aermacchi signed an important agreement with Boeing, through the Support Systems Division of Boeing Defense, Space & Security. The two companies cooperate on marketing, sales, training and product support activities in some market areas for the M-346 and the M-345 basic-advanced trainer.

Combining the support and training systems capabilities of Boeing with those of Alenia Aermacchi further improve mission effectiveness and reliability, help reduce the total cost of ownership and further strengthen the advantages of the M-346 and M-345.

This strategic alliance increase the two companies' commercial presence in the international market for next-generation trainers by offering the best 'market solution' to meet customer needs.

The M-346 programme is attracting increasing interest from potential international customers and partners. Besides the mentioned Italian Air Force, Singapore and the United Arab Emirates, additional opportunities exist on leading markets such and other European and Worldwide Countries.

**M-346 TECHNICAL DATA**

## Dimensions

Span	9.72 m	(31.89 ft)
Length	11.49 m	(37.70 ft)
Height	4.91 m	(16.11 ft)
Wing area	23.52 sqm	(253.2 sqft)

## Weights

Takeoff clean	7 tons class	(15,500 lb class)
Takeoff maximum	10 tons class	(22,000lb class)
Max external load *	3,000 kg	(6 600 lb)

\* Up to nine pylon stations for Air-to-Air and Air-to-Surface stores

## Power Plant and fuel

Turbofan	2 x Honeywell F124-GA-200
Max Thrust, SLS, ISA	2 x 2,850 kg (2 x 6,280 lb)
Internal fuel, usable	2,000 kg (4,410 lb)
External fuel, usable (3x630 lt tanks)	1,515 kg (3,340 lb)

## Performance (Clean, ISA)

Max level speed	590 KTAS
Limit speed	572 KEAS/1.2 MN
Minimum flying speed	90 KCAS
Rate of climb (S.L.)	22,000 ft/min
Service ceiling	45,000 ft
Range Clean/3 Ext. tanks (10% reserve)	1,070/1,470 nm
Max sustained Load Factor (S.L.)	8.0 g
Max sustained Load Factor (15,000 ft)	5.5 g
Max sustained Turn Rate (15,000 ft)	13 deg/sec
Takeoff Run (S.L.)	420 m (1,380 ft)
Landing roll, 20% internal fuel (S.L.)	550 m (1,800 ft)
Limit Load Factor	+8/-3 g