

COMPANY PROFILE

Aero | VODOCHODY

AERO Vodochody, Odolena Voda, Czech republic

- The largest aviation technology manufacturer in the Czech Republic
- One of the oldest aviation technology manufacturers in the world (* 1919)
- Focused on development, production, sales and support of civil and military aerospace technology
- Extensive experience from production of over 11,000 aircraft
- High-quality technological base
- AS 9100 / ISO 9001 certified quality management system
- Well-established cooperation with leading aerospace manufacturers
- Convenient location near Prague, the Capital of the Czech Republic
- More than 1200 employees
- The sole shareholder of the Company is private equity group Penta Investments

YOUR PREFERRED PARTNER IN AEROSPACE TECHNOLOGIES



SUBSIDIARIES

Technometra Radotín | Odolena Voda, Czech Republic
Development and production of landing gears and other aerostructures

Vodochody Airport | Odolena Voda, Czech Republic
Private international airport

Clarex Investments | Povazska Bystrica, Slovak Republik
Aircraft Engine MRO

AEROSTRUCTURES PROGRAMS

Aero | VODOCHODY

Aerostructures Programs Portfolio

- Sikorsky Aircraft Corporation – S-76 helicopter (since 2000)
- Sikorsky Aircraft Corporation – UH-60M Black Hawk helicopter cockpit (since 2010)
- Embraer – KC-390 design and built to print packages
- Sonaca – Bombardier CSeries design to build fixed leading edge program (since 2009)
- Alenia Aeronautica – C-27J Spartan center wing box (since 2006)
- Latecoere – Embraer 170/190 door subassemblies (since 2007)
- Saab – JAS-39 Gripen pylons (since 2008)
- Boeing Company – F/A-18E/F/G gun bay door (since 2001)

Embraer 170/190:
door subassemblies

CSeries: fixed
leading edge

Sikorsky S-76:
complete helicopter ready
for dynamic parts installation

UH-60M Black Hawk:
(helicopter) cockpit

WE COOPERATE WITH LEADING AEROSPACE MANUFACTURERS ON WORLD-CLASS AEROSTRUCTURES PROGRAMS

Embraer KC-390:
Wing Fixed Leading Edge, Rear Fuselage II,
all Cabin Doors and Cargo Ramp

Alenia C-27J:
center wing box

COMPLEX AEROSTRUCTURES:

- Participation in entire life cycle of civil and military projects, from development to industrialization and validation of products
- Competence to design and produce complex structures with high degree of product finalization, including systems integration and testing, full control of quality, full supply chain management and complex customer support starting from production transfer phase, through implementation of customer's requirements during production phase to after-sales support
- Combination of experience in aerospace production dating back to 1919 and every-day practice within running serial production, using the latest technology and test methods

AEROSTRUCTURES PROGRAM

SIKORSKY S-76 HELICOPTER

Aero | VODOCHODY

S-76 Helicopter Production and Services

- Fully assembled and equipped helicopter, ready for installation of dynamic parts
- Avionics, hydraulic, electric and fuel system installation
- Tube manufacture and tube system installation
- Electric wire harness manufacture and installation
- Composite parts assembly
- Fuselage assembly
- Detail part fabrication, including application of special processes
- All ground tests not requiring dynamic parts, including water, fuel, hydraulic and electric tests
- All surfaces primed
- Full supply chain management
- Warranty and after-sales services, including repairs and spare parts sale

Sikorsky S-76:
complete helicopter ready
for dynamic parts installation



**HIGH-QUALITY AND RELIABILITY
OF OUR DELIVERIES ARE PROVEN
BY OBTAINING UTC SUPPLIER GOLD AWARD**



S-76 PROGRAM IN NUMBERS:

- First S-76 unit completed in December 2000
- 8,500 components assembled, 3,700 produced by Aero
- More than 200 suppliers managed by Aero
- Yearly production rate reaches up to 50+ helicopters
- In 2010 Aero begins to produce brand new model S-76 D model replacing S-76C++

AEROSTRUCTURES PROGRAM

SIKORSKY UH-60M BLACK HAWK HELICOPTER

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UH-60M Black Hawk Helicopter Production and Services

- Fully assembled cockpit of the UH-60M Black Hawk helicopter
- Installation of electric harnesses and control systems
- Fabrication of parts, including application of special processes
- Control of the supplier chain
- Provision of spare parts

AERO VODOCHODY IS PROUD TO BE PART OF A TEAM THAT PRODUCES THE LEGENDARY MILITARY HELICOPTER.

BLACK HAWKS HAVE BEEN IN THE U.S. ARMY SERVICE SINCE 1978. MORE THAN 3000 VARIANTS OF THE BLACK HAWK ARE OPERATED WORLDWIDE AND AIRCRAFTS ARE BEEING ORDERED BY MANY INTERNATIONAL CUSTOMERS.



UH-60M Black Hawk: cockpit

UH-60M BLACK HAWK PROGRAM IN NUMBERS:

- Contract signed January 2010
- First cockpit manufactured May 2011

AEROSTRUCTURES PROGRAM

ALENIA C-27J CENTER WING BOX

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C-27J center wing box production and services

- Fully assembled and equipped center wing box ready for final aircraft assembly
- Integral fuel tanks
- Engine, fuselage and flap hinges
- Leading edges, including de-icing boots
- Detail part fabrication, including application of special processes
- Electric system manufacture, testing and installation
- Tube manufacture and tube system installation
- Testing of all systems, including final fuel leakage test
- All surfaces primed
- Full supply chain management
- Production control of several configurations
- Warranty and after-sales services, including repairs, spare parts delivery and modification changes

Alenia C-27J:
center wing box

THE CENTER WING BOX PRODUCTION FOR ALENIA AERONAUTICA REPRESENTS A DELIVERY WITH HIGH VALUE ADDED



C-27J CENTER WING BOX PROGRAM IN NUMBERS:

- Contract signed in September 2006
- First center wing box completed in December 2007
- 3,200 components, 60 % produced by Aero
- 6 configurations
- More than 30 suppliers managed by Aero

AEROSTRUCTURES PROGRAM

JAS-39 GRIPEN NATO STANDARD PYLONS

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JAS-39 Gripen Pylons Production and Services

- Fully assembled pylons ready for installation on aircraft
- Detail part fabrication, including application of special processes
- Electric harnesses manufacture and testing
- Composites production and assembly
- Tube manufacturing and installation
- Supply chain management
- Spare parts delivery

JAS-39 Gripen: pylons



WITHIN TWELVE MONTHS AERO HAS RAISED ITS PRODUCTION, QUALIFIED ALL SPECIAL PROCESSES AND PRODUCED FIRST PYLON ASSEMBLY.

PROGRAM IN NUMBERS:

- Contract signed in October 2008
- First pylon completed in October 2009

AEROSTRUCTURES PROGRAM

BOMBARDIER CSERIES PROJECT

Aero | VODOCHODY

Subject of Cooperation

- AERO is responsible for design, development and manufacturing of the Wing Fixed Leading Edges for a new and innovative CSeries Aircraft for the Canadian aerospace manufacturer Bombardier
- For this project AERO partnered with a Belgium company SONACA
- AERO is a member of a joint SONACA-AERO realization team which is part of the Joint Development Team led by Bombardier Aerospace Company
- Aero is going to invest into new technologies required by the project



**AERO SIGNED ITS HISTORICALLY FIRST CONTRACT
ON INTERNATIONAL RISK-SHARING PROJECT WITH
BELGIUM COMPANY SONACA AT THE PARIS AIR-SHOW
IN JUNE 2009**

PROGRAM IN NUMBERS:

- Contract signed in June 2009
- First prototyp at the beginning of year 2012
- First flight in 2012
- Entry into service 2013

AEROSTRUCTURES PROGRAM

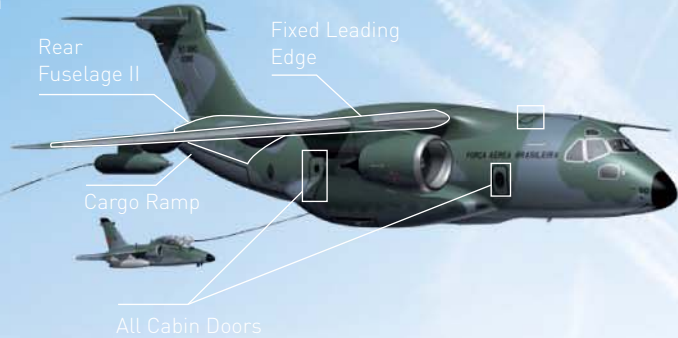
EMBRAER KC-390 PROGRAM

Aero | VODOCHODY

Subject of Cooperation

On the KC-390 aircraft program for the Brazilian aerospace manufacturer Embraer Aero is responsible for:

- Design, development, industrialization and serial production of the Wing Fixed Leading Edge
- Industrialization, tolling design, tooling production and serial production of the Rear Fuselage II, all Cabin Doors and Cargo Ramp
- Providing after sales support for all products



AERO IS A PARTNER TO EMBRAER IN DESIGN, DEVELOPMENT AND PRODUCTION OF NEW MILITARY MULTIROLE TRANSPORT AIRCRAFT KC-390



PROGRAM IN NUMBERS:

- Contract signed 1Q 2011
- First flight in 2014
- Initial Operational Clearance 3rd Q 2015
- Entry into service 2015
- Final Operational Clearance 1st Q 2016

DEFENCE & MRO

Aero | VODOCHODY

MRO & Defence Programs Portfolio

- **L-39 Albatros** - single-engine, two-seat jet training and light attack aircraft
- **L-59 Super Albatros** - combines design characteristics and experience from the L-39 Albatros family operation with a new more powerful engine, advanced avionics (including head-up display), improved airframe and other systems
- **L-159 Combat & Training System** - advanced training and light combat aircraft, integrated logistic support, mission planning and debriefing and ground based training system
- Support services for military and commercial aircraft

L-39 ALBATROS



L-59 SUPER ALBATROS



HAVING PRODUCED 6,500 UNITS, REPRESENTING TWO THIRDS OF THE WORLD PRODUCTION, WE ARE HISTORICALLY THE LARGEST JET TRAINING AIRCRAFT PRODUCER IN THE WORLD

L-159 ALCA



COMPLEX SUPPORT SERVICES:

- Analysis and Design
- Maintenance, Repair, Overhaul (MRO)
- Retrofit, Modification, Upgrade (RMU)
- Ground and Flight Testing
- Customer Training
- Logistics Support

DEFENCE & MRO

Aero | VODOCHODY

L-159 Combat & Training System

L-159 Training & Combat System

- Advanced training and light combat aircraft
- Mission planning and debriefing
- Ground based training system
- Integrated logistics support
- Extended operational support

L-159 Advanced Light Combat Aircraft

- Single-seat light multi-role combat aircraft
- Optimized for a variety of air-to-ground, air-to-air and reconnaissance missions
- Equipped with a state-of-the-art multi-mode radar for all-weather, day and night operations
- Designed to carry a wide range of external stores, including air-to-air and air-to-ground missiles and laser guided bombs

L-159 Two-Seat Versions

- Two-seat advanced training and light combat aircraft
- Primarily designed for advanced and lead-in-fighter training
- Optimal solution for training of pilots of the latest generation fighters
- Available as a fast and low-cost conversion of Czech Air Force surplus L-159 ALCA aircraft (L-159T) or as a new-built aircraft (L-159B)

L-159 IS A FAMILY OF ADVANCED TRAINING AND LIGHT COMBAT AIRCRAFT, WHICH MATES AERO'S LONG-TERM EXPERIENCE IN DEVELOPMENT AND PRODUCTION OF MILITARY JET AIRCRAFT WITH LATEST ADVANCES IN AVIONIC, ENGINE AND AIRCRAFT SYSTEMS TECHNOLOGY

L-159 ALCA

L-159 B

L-159 IN SERVICE WITH CZECH AIR FORCE:

- Single-seat L-159 ALCA advanced light combat aircraft entered service in 2000
- Two-seat L-159T advanced training aircraft entered service in 2007
- Within Czech Air Forces, the L-159 fulfills a wide range of tasks ranging from advanced and operational training to air-to-ground and air-to-air missions
- The L-159 regularly participate in NATO international exercises (Tactical Leadership Programme, NATO Air Meet, Clean Hunter, Flying Rhino)
- AERO is a long term supplier and stable partner of Czech Air Force

DEFENCE & MRO

Aero | VODOCHODY

L-39 Albatros / L-59 Super Albatros

L-39 Albatros

- Single-engine two-seat jet training aircraft
- Primarily designed for basic and advanced training
- Various upgrades available
- In service with numerous international air forces and Czech Air Force

L-59 Super Albatros

- Combines design characteristics and experience of the L-39 Albatros family
- New more powerful engine, advanced avionics (including head-up display), improved airframe and other systems
- First flight of the L-59 was carried out in 1986 and produced in a number of 65 units

L-59 SUPER ALBATROS



AERO HAS DELIVERED MORE THAN 2,900 UNITS OF SEVERAL VERSIONS OF L-39 ALBATROS. THESE AIRCRAFT STILL SERVES WITH MANY AIR FORCES AND ARE ALSO POPULAR AMONG PRIVATE PILOTS, ESPECIALLY IN THE UNITED STATES



L-39 ALBATROS

SUSTAINMENT PROGRAMS:

- Integrated logistic support
- Spare parts delivery
- Service-life extension
- Overhauls
- Special repairs
- Systems modifications
- Upgrades

FINAL PRODUCTION TRADITION

Aero | VODOCHODY



L-59T



L-39C



L-29



Ae 270



Bücker Bü-131



Ae-45



Marcel Bloch MB.200



MIG-15



A-1

WE HAVE ALWAYS RESPONDED TO THE LATEST MARKET CHANGES AND FOCUSED ON THE HIGHEST QUALITY OF CUSTOMER SUPPORT

COMPOSITE MANUFACTURING



AERO VODOCHODY is offering its composite parts manufacturing capabilities based on 25 years experience in design and manufacturing of parts for aircrafts L-59, L-159 and Ae-270, and now for more aircraft and helicopters platforms, under Customer qualification.

Capabilities

Prepreg hand lay-up / autoclave curing		Industrialization and tooling Mechanical and Chemical labs Maximum size 3,5 x 8 m
Structural meta-metal adhesive bonding		

Products

Engine air duct extensit	
Leading edge, Ailerons	
Wing tip fairings	
Cockpit armour plates	
Pylon fairings	

TECHNICAL CHARACTERISTICS



Shop description

	Shop 1	Shop 2
Total surface	1 600 m ²	5 400 m ²
Technology	Pre- preg hand lay-up / autoclave or oven curing	Pre- preg hand lay-up / autoclave or oven curing
	Structural adhesive bonding	Hybrid technology RTM / RI
Production	R&D pre-series / low rate	Serial
Clean room (class 100 000, ISO 8)	72 m ²	500 m ² + 500 m ²
Processing equipment		Cutting machine with digital process control - 5 axes machining (4 x 1.5 m)
Inspection equipment	NDT, mechanical testing Tinius Olsen	Non-destructive control of finished parts (A-scan, B-scan), X-ray
Full capacity	20 operators / 2 shifts	80 operators / 3 shifts

Autoclaves

		Shop 1	Shop 2
Internal dimensions (in m)	diameter	1.7	3.8
	length	3.5	9
Max. working pressure		9.5 bar	11 bar
Max. working temperature		200 °C	250 °C
Maximal sizes of parts		1.5 x 2.5 m	3.5 x 8 m

Curing ovens

	Shop 1	Shop 2
Internal dimensions (in m)	2 x 2 x 3 m	3 x 2.5 x 8 m
Max. working temperature	200 °C	250 °C

LANDING GEAR

Aero | VODOCHODY

AERO Vodochody is an established landing gear manufacturer succeeding legendary Czech landing gear producer Technometra Radotín.

AERO Vodochody offers a unique mix of capabilities and experience to deliver high precision sub-assemblies, as well as complete assemblies of medium size landing gears fully installed and tested.

High Precision Fabrication



- Turning (NC & CNC universal, conventional)
- Milling (horizontal, vertical, tool, copy)
- Drilling, boring, reaming (horizontal, vertical)
- Grinding (cylindrical, cut-outs, slab, sharpening)
- Bending – Tube finalizing (\varnothing 42 x 2.5)

Assembly



- Finalization
- Assembly of actuators
- Hydraulic circuits
- Clean room
- Wire harness shop

Special Processes

- Shot peening
- Glass bead peening (wet)
- Flap peening
- Chrome plating
- Electro-polishing
- NDT / MPI, FPI
- Alkaline degreasing
- Cadmium plating
- Anodizing
- and other 18 processes

Testing

- Hydraulic test /bench
- Pressure test
- Total stroke test
- 3D measuring equipment
- Static and stress analysis
- Fatigue analysis
- Reliability testing
- Drop test

PROGRAMS

Aero | VODOCHODY

L410

Complete landing gear system for this Czech manufactured small utility aircraft

- Main landing gear and nose landing gear
- Fully tested and ready for installation
- **Delivery rate:** 1 landing gear system a month
- **Customer:** Aircraft Industries



A320 Side Stay assemblies

Fabrication, assembly and testing of the A320 main landing gear side stays and actuator

- Main landing gear side stay and lock stay actuator
- Assembled and tested and ready for installation
- **Delivery rate:** 8 side-stays a month
- **Customer:** Messier-Bugatti-Dowty

VUT 100 Cobra

Complete landing gear system for this Czech manufactured single-engine sport aircraft



L159 Family

Fabrication, assembly, testing and overhaul of AERO's legacy programs L39, L59, and L159



VUT 100

L-159B