MAGNUS

COMPOSITE

ADVANCED COMPOSITE
STRUCTURES MANUFACTURING

ABOUT US

MAGNUS COMPOSITE

Magnus Aircraft Zrt. is a multinational sport and training aircraft manufacturer company that was founded in 2014. Business headquarters and the assembly plant is situated in Southern-Hungary, near Pécs. This location is the center of serial production, sales and marketing activities of worldwide corporation.

The organizational structure of the company is traditional, divided into different functional areas: R&D, Finance-Accounting, Controlling, Sales & Marketing, Quality Management, Flight-Safety, HR, Production, Purchasing, Warehousing, Facility Management etc.

In the beginning of aircraft production, Magnus Aircraft Zrt. was producing its only product, Fusion aircraft that was designed and developed by Magnus engineers and since then this product left its footprint all around the world. Today, Magnus has its own modern assembly plant where all steps of the Fusion aircraft family manufacturing processes are completed. The company offers "all in one" solution to potential partners, from engineering and development to production and assembly. In addition to producing its own products, thanks to an accurate analysis of customer needs and the quality of delivered products, Magnus Aircraft Zrt. is becoming a qualified supplier of composite structures. Advanced composite industry, which is a specific sector of the composite industry, is characterized by using high-performance resin systems and high-strength, ultra-stiff fiber reinforcement. Consequently, aerospace industry is the major consumer for advanced composites including military and commercial aircraft. Additionally, the use of advanced composites has been adapted in sports equipment production in order to achieve a lighter structure and stronger resistivity.

A highly specialized team of Magnus Aircraft's engineers and trained personnel can transfer the target requests to technical specifications and can develop new structures and technologies for advanced high performance aircraft and other products.

INFRASTRUCTURE AND MANUFACTURING CAPABILITIES

In terms of engineering and production, the technology available to Magnus Aircraft Zrt. encourages the development of monolithic structures and sandwich designs, featuring a high degree of component integration and complex shapes.

The manufacturing activity production plant of Magnus Aircraft Zrt. is divided into the following production segments: preparation and lamination area, cutting and trimming room, painting and finishing area and assembly area.

The 5100 square meters composite production plant was completed in 2019.

- Separate departments for all production processes.
- Production facility equipped with contemporary production equipment and installations.
- Full temperature and humidity control.
- Clean room with ventilation system based on 2000 square meters.
- Integrated vacuum system and an additional local vacuum system.
- Heat treatment at a maximum temperature of 90°C, dimensions: 9000 x 4000 x 3000 mm.
- Painting booths with 2 chambers, dimensions: 10000x4000x3000 mm, and 8000 x 4000 x 3000 mm (Iwata and Festool professional equipment).
- Cutting plotter for dry and impregnated materials, working area dimensions: 6000x2000 mm.
- 3-Axis CNC milling machine for molding, dimensions: 6000x2000x200 mm (major works are completed by subcontractors).
- MetraScan 3D optical scanner for mold inspection, reverse engineering and quality control.
- 3D printer using filament for rapid prototyping, dimensions: 2000x1000x1000 mm.

Magnus Aircraft's manufacturing know-how of advanced composite structures includes manufacturing technology, development and production engineering, tool design and manufacturing, detailed production of components and integration of fittings. Production is supported by composite oriented production planning, tracking and control.

- Design engineering: geometric and substructure optimization, molding and component design with detailed lamination plans, gluing, heat treatment, painting, stress testing and design validation.
- Production: using wet-layup and vacuum infusion technology; components made of glass or carbon fiber using epoxy, vinyl ester or polyester matrices.
- CNC molding tools, fully model-based molding solution
- Complete traceability of used materials and production stages.

SERVICES

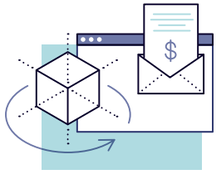
You are free to join in any stage of the procedure depending on the readiness of your product.

1 ARRIVAL OF INQUIRY

Please feel free to contact us at any of the contact details regarding your composite manufacturing needs. We will send you a short questionnaire to get a more precise idea of your requirements. You can also include the parameters of the desired product and your (preliminary) ideas about the design.

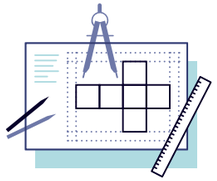
2 CONCEPTUALIZATION

Based on the completed questionnaire and attached documents, we will prepare a preliminary design of the product for you. If you require, we can have further consultation regarding the exact function of the requested product or any other requirements you desire. As a final step, the preliminary design will be prepared for you: 3D model, composite substructure, production technology, preliminary design of the production tool.



3 PRELIMINARY QUOTATION

We will send you our proposed concept and initial calculations, including the cost of product development and the estimated price of the prototype and mass-produced products. If necessary, you can request changes or additional information about the design of the product. If our proposal is satisfactory, we can immediately finalize the contract for product development.



4 FINALISATION OF PRODUCTION TECHNOLOGY

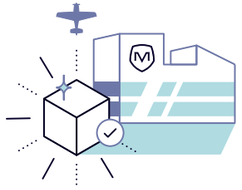
We will prepare the design of your product, down to the last detail, finalize the tooling plans and set up the necessary documentation. We will also conceptualize the quality requirements of the product in consultation with you or your dedicated expert if needed.

5 FINAL QUOTATION, CONTRACT

Here you can send us your quote for prototype production and the price of the mass-produced product (if you make changes to the mass-produced product after prototype production, this price may still be valid!). If everything is in order, we can conclude the contract for prototyping.

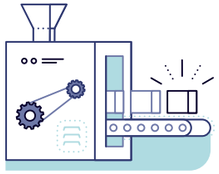
6 PRE-PRODUCTION

According to completed questionnaire and attached documents we will prepare the preliminary design of the product. If necessary, further consultation can be arranged with the customer on the exact nature of the product's requested function or other requirements. At the end of this process, we will prepare the preliminary design of the product: 3D model, composite substructure, manufacturing technology, preliminary design of the preliminary production tool.



7 PROTOTYPE

This will be your product prototype. We will provide you the first product sample and discuss whether it meets all your requirements that had been previously discussed. You can test the product prototype, and, at this stage, we can still make minor changes if required. The next step will be to prepare your personalized product for mass production. After that, we can finalize the exact cost price per product for you.



8 SERIES PRODUCTION

All you need to do is prepare your customised product for mass production. After that, we can finalise the exact cost price per product for you. We will manufacture your products in the agreed quantities and at the agreed timeframe.

9 FINISHED PRODUCT, DELIVERY

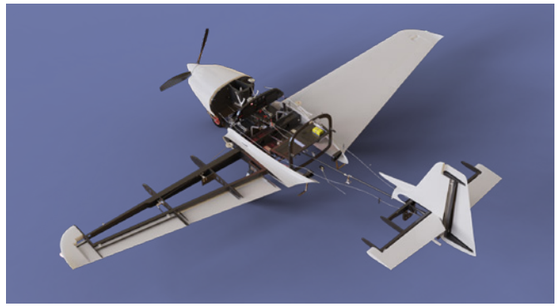
We will deliver the finished products to you as agreed.

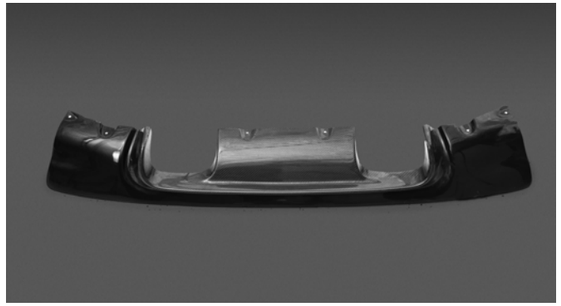
MAGNUS COMPOSITE

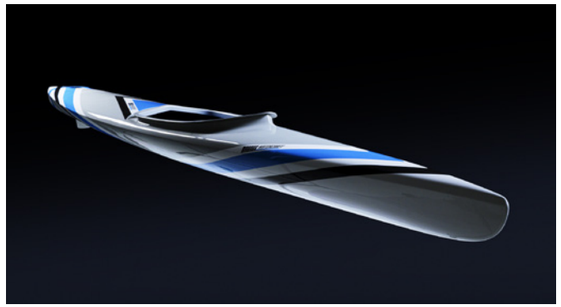
PROJECTS

Magnus Aircraft Zrt. product line includes aircraft products, advanced composites and water sports equipment. Currently, Magnus manufactures aircraft composite elements for its own Fusion family, Fusion 212 and Fusion 213. Our monthly capacity is 8-10 aircraft composite units.

Besides it, we are producing yacht composite frames, kayaks, truck bodies, car bumpers.







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QUALITY MANAGEMENT SYSTEM

From the very beginning the quality management and inspection procedures have been integral part of our production and production development. The production and inspection are fully documented and production tracking enables us to quickly detect and remove any faults that may occur in the process of development and manufacturing.

We operate under strict total quality management processes and our long standing collaboration with costumers and advanced material supply partners ensures we maintain our position in the composites industry.

As part of Quality Management System hereby we present you the brief description of production documentation and tracking/ monitoring system:

- Detailed work instructions to produce composite elements and assembled / glued components (including composite substructure, used base and auxiliary materials, tool preparation, gelcoat coating, etc.).
- Production worksheets for composite elements and assembled / glued components by serial number (includes LOT number of raw materials used and proof of inspection of each work step).
- Composite components and assemblies tracking on the worksheet per serial number.
- Resin testing documents per serial number.
- Heat treatment documents for composite elements and assembled / glued components per serial number (Contains temperature, duration, humidity as a log file).
- Detailed conformity inspection / quality control instruction for composite components and structures.
- EASA Part21. issuance of an EASA Form1 document for composite components and assembled / bonded components after production organization certification.
- 3D scanning for tooling and monitoring.

In addition to these base documents further production documentation is derived based on specific requirements of our partners or requirements of the structure/assembly.

The suppliers of commercial items and our other business partners are regularly evaluated annually on the based on few criteria: quality, delivery accuracy, communication, adequacy of documentation, etc.

Also, our subcontractors - who manufacture components for us according to our plans - are regularly audited annually in accordance with the ISO 9001 standard and Part21 regulations. For stress testing we have a test bench in-house. For design verification in the model space (FEM) we co-operate with Econ Engineering Kft. that has extensive experience and knowledge on simulating composite structures. We introduced an integrated ERP system called QAD that can monitor all our operating processes.

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QAD

CERTIFICATES – AVAILABLE:

- Suitable Supplier for NATO Tenders
- Member of Defence Industry Association of Hungary
- Military Technology Activities Approval

CERTIFICATES – ACQUITISION IN PROGRESS:

- Production Organization Approval based on 748/2012 EU Regulation (Part21) EASA (Light Aircraft, Parts, Maintenance, Issue of Permit to Fly)
- AQAP 2110 / 2120 / 2130
- AS/EN 9100 / 9120

PERSONNEL

Currently about 90 professionals work at the modern factory of Magnus. The company is one of the most attractive employers in its region, thanks to the competitive salary-system and the very ergonomic working-conditions.

The top-management consists of 3 directors: CEO / COO / CFO, followed by functional managers below them.

In parallel with the development of the company, the number of employees also increased in the past years. In order to create the right knowledge base and the necessary know-how, the white-collar and special expert staff had to be formed first. Afterwards, with the growth of production, the number of blue-collar workers had also increased significantly. They will be soon the majority group of workers within the company.

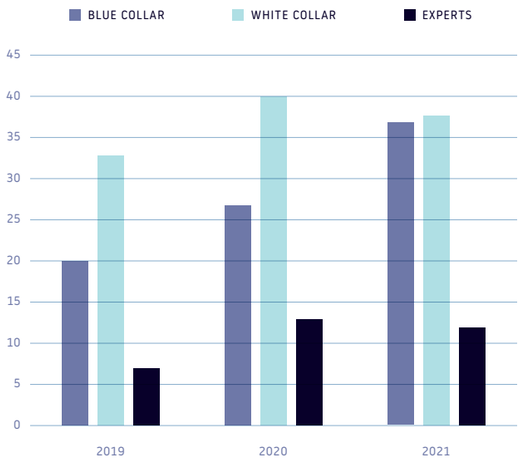
The current ratio between white-collar and blue-collar workers is about 45-55%, from which the number of blue-collar workers will be growing in 2022. Workers of the production currently work in one shift that will be changed into two shifts soon.

MAGNUS COMPOSITE

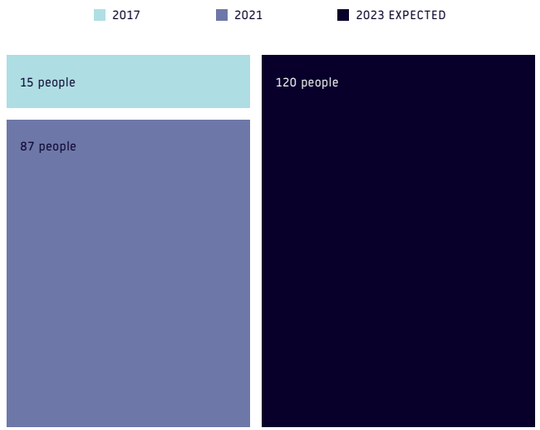
We aspire to be the number-one manufacturing and support company whose comprehensive capabilities, integrated processes and innovative employees advance the prosperity of its partners and the company itself. We team as one and cooperate with our customers to excel over the hardest challenges.

We constantly improve our manufacturing, inspection and control procedures in order to provide the best services to our customers. Thanks to major investments in facilities, technologies and resources, Magnus Aircraft Zrt. has become a trustworthy partner and aspires to implement more and more challenging technological projects.

COMPARISON OF THE NUMBER OF EMPLOYEES BASED ON THE FIELD OF WORK



GROWTH OF LABOUR



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