



Why choose a MAGNI gyroplane ?

THE MATERIALS

All materials used by Magni Gyro for parts that are structurally important or relevant are fully certified aerospace materials, which are fully traceable using our quality control system.

Normalised 4130 “CROMOLY” steel

4130 “Cromoly” steel is alloy steel, which contains Chromium and Molybdenum and is widely used in the aerospace industry. The Chromium increases the hardness, elastic limit, tensile strength and resistance to corrosion and wears whilst reducing thermal conductivity. The Molybdenum further increases the strength and the hardness and improves the response of the metal to the various treatments to which it is submitted. The steel we use is “normalized” which is a treatment that improves the grain of the steel returning it to its original condition after being worked; this leads to an improvement in the strength and increases the performance of the welds.

These alloy steels have much greater strength in both compression and tension and a lower specific gravity than other steels, including stainless steels. The 4130 alloy steel we use is the aeronautical steel par excellence It is particularly strong (many other steels, including stainless steels, break well before the 4130 even bends!) and is more corrosion resistant than even many of the stainless steels – a particularly useful characteristic if operating in coastal areas of Canada.

We use 4130 steel for the structure, the controls and all the metal parts that have any structural importance to our gyroplanes.

The composites

Composite materials can be engineered to provide a combination of characteristics that are very difficult, if not impossible, to find together in natural materials. They combine great strength with light weight and, due to their “composite” nature, can demonstrate a wider range of characteristics than any other material to meet the diverse requirements of a gyroplane. The resins, cloths and when required, foams that we use are fully traceable and certified materials.

It is for precisely these reasons that we chose to use composite materials not just for structural parts but also for the rotors, which are as a result widely recognized as being amongst the very best gyroplane rotors available anywhere:

- Our composite rotors do not have a limited life; they can last forever; whereas metal rotors have a limited life defined by the number of cycles they are operated for.
- It is possible to “build” a composite according to one’s exact strength, flexibility, elasticity and weight requirements; this means it is possible build rotors with exactly the characteristics you require – and we do this.
- Inside a composite blade there are no empty cavities and therefore no air “stagnation”. As a result, there is no build-up of condensation.
- Composite materials have amongst the best qualities of resistance to humidity and salt which is the main reason for their wide use in military and civilian ships. Should you inadvertently be caught in rain whilst flying, the worst damage that can occur after several hours of such weather is purely cosmetic damage to the leading edge of the outer skin towards the rotor tips. This kind of damage is not dangerous and can be easily repaired by the pilot.

Most modern helicopters are fitted with composite blades. Since a significant part of their market is a military one, it is important that the rotors are able to take the strike of a fast moving foreign object like a bullet without shattering – unlike metallic cell-structure rotors, composite rotors can indeed survive such an impact for long enough to land safely.

- Composite materials enjoy excellent long-term stability characteristics, thereby ensuring no degradation of performance over time.
- Composite rotors also tend to be heavier than metal ones and this is of particular value in the case of the unpowered rotors in a gyro. Although they spin up more slowly than the lighter metal ones, they also slow down more slowly and store more energy making the flight characteristics more forgiving and safer.

The components

Magni Gyro only buys third party components that are certified or that comply with detailed and demanding data sheets. For example the hardware for the control line is strictly of aeronautical grade. The teeter bolt is a PAN series bolt, and is the same bolt used in Tornado fighter aircraft.

THE PRODUCTION

The quality of Magni Gyro products is well known and is based on rather more than just the quality of the materials and components used. There is only one way to make the most of

and enhance the characteristics and qualities of a good material and that is for the skills and procedures used to work with and on it to be at least of the same high quality.

Production process

The production process makes use of advanced technologies and highly specialized and skilled labour. All the work is structured within the framework of a very strict and demanding production schedule embedded in the Quality Management System that guarantees the achievement and the continuity of the highest quality.

Here are some examples of the techniques and processes we use to ensure our gyroplanes meet our exacting standards:

- The parts belonging to the rotor head, control chain assemblies and the critical joints of the structural components are machined to very fine tolerances using CAD/CAM technology. The work is subcontracted to a specialized and aeronautically certified company that works in strict compliance with our drawings, data sheets and descriptions.
- All welding is done with TIG Argon technology.
- The structural parts made of composite materials are produced using moulds that guarantee vacuum and constant temperature curing. As a consequence the parts produced are extremely strong.
- The rotor blades, being one of the most sensitive parts of the gyroplane, are produced in an air conditioned room where temperature and humidity are kept constant. Rotors and propellers are flight tested to check the dynamic balance using the Chadwick System tooling. This kind of system is used for the dynamic balancing of the rotors of most helicopters.
- A separate facility in the building is reserved for finishing and it is here that the parts are prepared for final painting, which takes place in our dedicated paint facility in another building immediately outside the main building.

The Quality System schedules the periodic calibration of the tools to make sure that there is no possibility of unacceptable variances appearing.

The labour force

Magni Gyro is very proud of the skills and of the professional specialization of the team.

The location of the Company within the “Italian Aeronautical Hub” (Agusta Westland, Aermacchi, Caproni and SIAI MARCHETTI are all just a few kilometers away) has enabled Magni Gyro to find and employ highly skilled and specialized workers.

The workers have special qualifications. Our Welding shift has the Welder's Approval issued by UK CAA.

In addition to this our workshop training transmits the experience and the skills accumulated during decades of work in this field to all our staff.

ENVIRONMENTALLY FRIENDLY TECHNOLOGICAL DEVELOPMENT

Magni Gyro is always very interested in new technologies and improvements that can lead to a better product and we always choose environmentally friendly solutions where possible.

The engine

Our gyroplanes are all powered by ROTAX four stroke engines and we optimize the installation to minimize fuel consumption and noise.

Painting

Recent anti-pollution laws highlighted the need for highly "protected" facilities for metallic painting. Magni Gyro has decided to use only low environmental impact paints. The range of colours available reflects this choice whilst guaranteeing the quality and the strength of the painting and its compliance with safety requirements.

THE SOLIDITY

Weight isn't always an advantage and we've tried to lighten the parts using new technologies where possible. However there are some aspects where Magni Gyro has chosen to accept the weight penalty if the result improves the strength and quality in key areas:

- The rotor is heavier than most of the rotors currently available for gyroplanes which leads to a higher inertia that helps autorotation and in keeping the rotor loaded – a crucial safety advantage
- Making the structure lighter can't provide the strength required. As a result, the structure isn't "light" - but it is a safe and strong one.
- All joints and fittings in the control line are CAD/CAM cut from solid block metal to increase strength and performance characteristics with reduced dimensional tolerances.

THE COMFORT

Italian design is famous for combining Style with comfort and every “*made in Italy*” production line strives to deliver products that fulfill this expectation. We are no different:

- Even for the partially enclosed models, the seating position is well inside the cockpit to ensure the pilot and passenger feel enclosed by the gyro and gives confidence and a feeling of control.
- The seats are padded to offer the maximum comfort to the pilot and passenger even on long flights. The different internal colours and design meet the most sophisticated tastes.
- The wide Lexan windscreens are positioned to fully protect both pilot and passenger from the slipstream, permitting flight without glasses or visors (though these are recommended, particularly in cooler climates).
- Because we are not all the same, the padded seats have been designed to be comfortable for people with both smaller and larger physiques; the rudder pedals are adjustable in minutes for length to cope with both short and tall pilots.
- The shape of the windscreen protects the pilot’s hands when on the throttle which is helpful in the cooler Canadian climate.
- The proven stability and efficiency of the electric trim minimizes the pilot’s effort to maintain steady flight by compensating for all the control forces required to maintain heading and attitude.

All Magni gyroplanes can be easily loaded onto a trailer. The only operation required before loading the gyro onto the trailer is to dismount the rotor blades. This is a very easy operation for two people to accomplish: it can be completed in a few minutes.

THE HIDDEN VIRTUES

The reasons for some of the solutions adopted by Magni Gyro on their gyros might not be obvious but nothing is done randomly. There is always a reason for adopting a particular solution.

For example:

- The layout of the instrument panel reflects particular care in its wiring: the reverse of our panel has been carefully designed to minimize the length and the twisting of the cables to reduce dispersion and interference. The result is a very neat and highly readable panel, which although it is not wide can be equipped with everything necessary.

- The baggage compartment is placed towards the center of gravity to minimize of the impact of the weight contained inside and to ensure that no baggage placed inside it can inadvertently place the aircraft outside its design balance thus ensuring flight safety.

THE STORY OF MAGNI GYRO

Vittorio Magni has been working in the sector of the gyros for 40 years. His background and technical knowledge come from the helicopter environment where he started his career 50 years ago. The expertise accumulated over these years derives from a deep understanding of, and open minded approach to, rotary aviation combined with a great deal of practical experience.

Magni gyroplanes are the result of continuous evolution over many years and have long been recognized for their quality, flight stability and their excellent handling characteristics.

More than 1000 Magni gyroplanes have been built and sold all over the world which makes our long term operating experience in all conditions unsurpassed by any other gyroplane manufacturer.

MAINTENANCE –TRAINING AND CUSTOMER CARE

Excellent customer service is one of the most important factors in the success of a product and we strive to provide it. To answer this worldwide need for customer support, Magni Gyro has developed a network of local agents able to provide training for pilots, supply spare parts and information for maintenance of gyroplanes.

Dealerships are established in well identified market areas and every dealer/agent must show that they comply with an agreed set of functions to an agreed standard depending on the available facilities and training capabilities.

COMMERCIAL APPROACH

We and our agents always listen to and, where possible, answer customers' requests even when they are non-standard. Magni Gyro provides a price list based on the standard gyro configuration based on the fit that most of our customers' request. The standard configuration incorporates the ROTAX 912S 100HP or ROTAX 914 turbo 115HP engine (equipped with gearbox clutch, airbox, *Flydat Rotax* and fuel pressure indicator)

We are always very pleased to offer our wide experience and competence to try and satisfy any customer request and we constantly develop our products in line with our quality ethos to meet new market requirements as they appear.