



The aim is to create a new AFP platform in a robot for 2D and 3D lamination processes.

It is time for robots

For over a year, MTorres has been developing and conducting research that achieves the highest accuracy requirements.

■ The Aerospace Industry is demanding the integration of robots in its manufacturing processes. Over the past few years, robots have been mainly used in different aircraft assembly phases in which accuracy and productivity were not particularly demanding, such as NDI Machines (Non-Destructive Inspection) or pick &

place operations. However, modern machining and lamination processes are now ready to include the use of robots. A very high level of competition, the reduction of costs in new program investments and the need to increase the process flexibility are some of the main reasons why robots will play a very important role in the world

ROBOT ACCURACY

The continuous improvement of volumetric accuracy is quite a challenge in our projects. The MTorres robot reduces up to one quarter of all positioning errors when compared to the efficiency of a commercial brand robot, and the errors have changed their unit of measurement; we are not talking about millimetres any more, but about tenths of millimeters.

of Aerospace manufacturing. This is why MTorres has been investing in its own research and development of a robot that complies with the requirements currently being demanded by the market. The Robot R+D project has two main objectives: the first is to integrate drilling and laying end effectors in a robot and the second one is to improve the volumetric accuracy of a commercial robot.

The robot is controlled by a Siemens CNC system, which transforms the positions and converts the anthropomorphic robot into a Cartesian machine. This making it easier for operators. Another major advantage of the integration of numerical control systems is the possibility to inherit MTorres' full development and know-how at the parts programming level, for both its drilling and lay-up products. Our powerful software programming tools, such as TORLAY and TORFIBER, are fully compatible with this new development.

And, finally, the Siemens CNC system offers a high degree of flexibility when integrating the robot into an industrial process.

UPCOMING AEROSPACE TRADE SHOWS THAT MTORRES WILL BE PRESENT IN:



1. JEC WORLD
Paris, France
8-10 March 2016

2. BIEMH
Bilbao, Spain
30 May - 4 June 2016

3. STADE CONVENTION
Stade, Germany
15-16 June 2016

4. ROCKWELL AUTOMATION FAIR
Atlanta, USA
8-10 November 2016

5. JEC ASIA
Singapore, Singapore
15-17 November 2016

6. METALMADRID
Madrid, Spain
16-17 November 2016

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Manuel Torres received the 2015 National Innovation Award

The King and Queen of Spain gave him the highest award to a continued, excellent and exemplary work.

OUR President got this award due to its strong commitment to innovation and its ability to develop technology activities in different sectors as aeronautics and energy.

The National Awards for Innovation and Design awarded by the Spanish Ministry of Economy and Competitiveness is the highest recognition given in the country to companies and professionals who have been distinguished for their excellent and exemplary career. Its main aim is to promote the culture of design and innovation, both in business and in our society.

Manuel Torres was the first of the six award winners in receiving his statuette, a valuable testimony of 40 years of hard, excellent and exemplary work, always with the courage of accepting technological challenges, focused on the utmost expression of creativity and effort, a tireless work ethic and a constant desire for self-improvement.

His example has influenced all the people around him: his employees, with whom he has shared his passion for progress and service to society; a team committed –always– with the ideas and projects that have made MTorres a referential point in several technological sectors for decades.

In conclusion, a human, professional team after the same dreams, with a more ambitious goal each day, succeeding in all the



Manuel Torres receives the award from the King Felipe VI.

“

We must be decisive when it comes to investment and face the risk to promote innovation”

THE AWARD

During the award of this honor to our president, the following text was displayed:

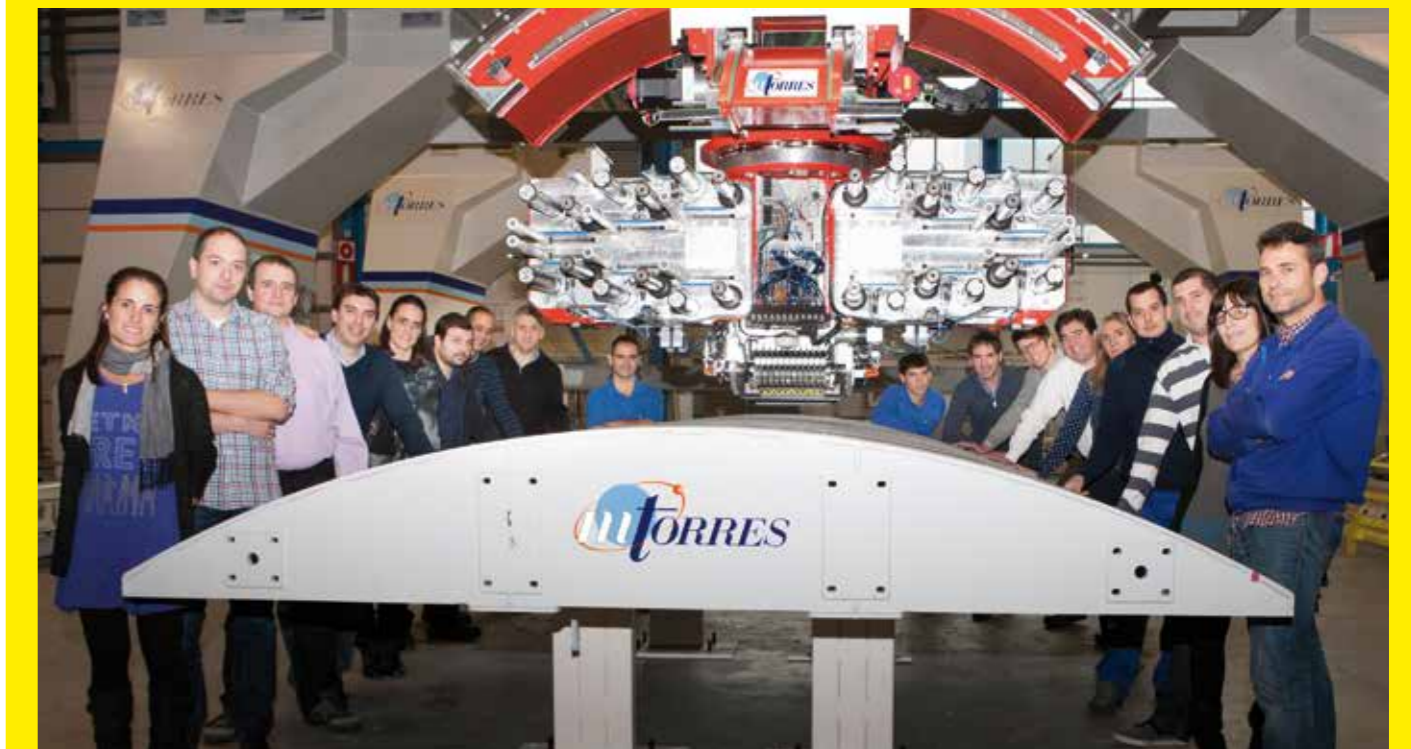
“National Innovation Award to Manuel Torres Martínez for his professional and business firmness, completely committed to innovation in the industrial process automation area. This strong commitment to innovation has been appreciated in his business activity and his capability to carry out a technology transfer activity in sectors as diverse as aeronautics, paper processing or energy.”

challenges faced and thus making the path that has brought us to where we are today.

A joint work which makes every worker of the company an essential part for achieving the recognition of Manuel Torres' work.

Our president encouraged the Creative Talent: “we must be decisive when it comes to investment and face the risk to promote innovation which, in conclusion, is welfare.”

MTorres delivers AFP/ATL machines for A350 wing skin fabrication



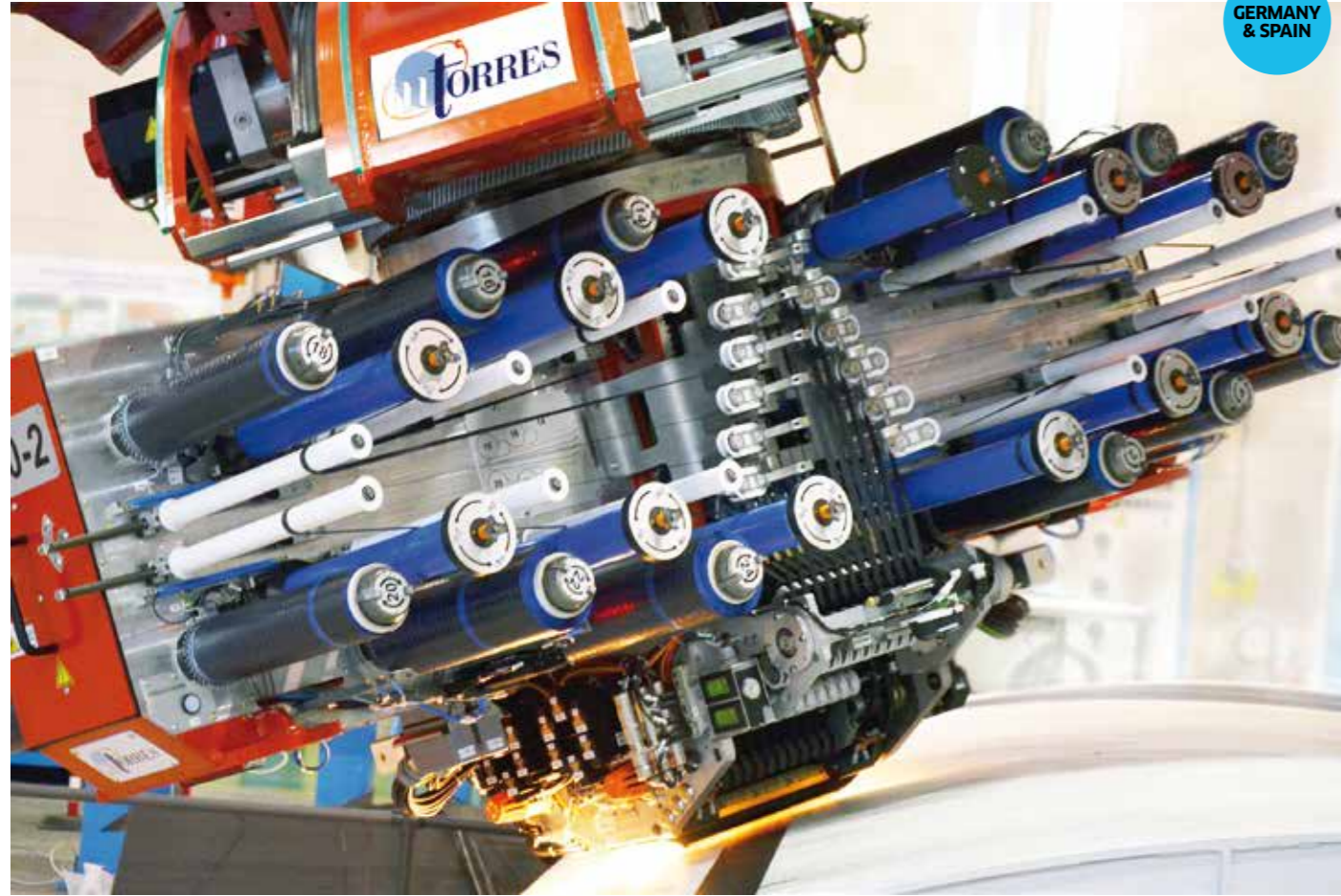
Wing MS21
Assembly Line
is operating

A robot project developed for the new sector requirements

NEW 2D
INTEGRATED
TORRESLAYUP
SYSTEM



Hybrid AFP/ATL machines delivered to Airbus for efficient A350XWB wings skins fabrication



GERMANY & SPAIN

A number of systems are being delivered to Airbus Plants, both at Illescas and Stade.

WHEN the A350XWB was launched, Automatic Tape Laying (ATL) Technology was defined as baseline to manufacture the wing main components. MTorres as the world leader on supplying composite manufacturing equipment for the Aerospace Industry, was contracted at that time to deliver a number of ATL machines throughout the life of the program.

Since then, the focus was put in on increasing productivity and reducing material waste, so when the ramp-up happened new technologies were available in order to match the increasing demands with an optimum investment model.

When that time arrived, MTorres had developed and implemented successfully a totally new generation of Hybrid ATL/AFP solution for wing shells fabrication, which provided a relevant boost on productivity (up to 3 times higher) and a huge material scrap savings to the user (clearly offsetting the higher cost of the slit tape).

The new platform combines AFP end effectors containing 24 -1/2" width with ATL heads being capable to be interchanged in less than two minutes. The AFP end effector has been designed to contain high weight spools, up to 9 Kg, reducing the need of end-effector changes.

The flexibility of this configuration provides an excellent capability to optimize the wing shells programming allowing on one side an excellent fly to buy ratio and reduced final component weight plus the possibility of using additional end-effector to laminate other materials as glass-fiber,

copper-mesh, etc. in the very same manufacturing cell reducing lay-up mold usage time, as well as logistics.

At the same time, the Gantry system has been completely re-designed to deliver a high dynamic machine capable of extreme accelerations. Combined with the MTorres patented rotary cutting system which allows cut and add at any speed, the new end-effector provides the highest productivity system in the market.

The result of this project is several cells completely integrated, low operator dependant, optimum space usage and reduced logistic.

The system first units are commissioned at both Illescas and Stade plants, starting the production of the new wing shells, manufactured using the most advanced and efficient technology available today. MTorres technology helps Airbus to fulfil those needs efficiently.



USA

All of MTorres America's employees gather at the future location of the new offices and facilities.

New Home for MTorres America

■ MTORRES has recently acquired a 60,000 m² piece of land located on 80th Street (Everett, WA), next to the impressive Boeing Everett plant, the largest building in the world in terms of volume.

MTorres America shall build within 2016 a brand new facility to home the complete team, Engineering, Assembly, Quality, Purchasing, Logistics, Service, Management, etc., under the same roof, just like in our sites in Spain.

This investment is a strategic move aiming to fulfil a number of goals about our presence in the North American market.

OUR OBJECTIVE

- **To put down roots.** We are here to stay. This is a long term move showing MTorres confidence on our potential in the USA.
- **Proximity.** We want to be close to our customers to understand their needs, to provide solutions that match their needs, with the purpose of innovating together with them.
- **Commitment.** This move proves our commitment with our US team

establishing a solid long lasting project and become a participating member of our new community.

• **Integration.** Following MTorres way of setting up our sites, we want to gather the activities of every department at our US site under the same roof. This model works well for the group as a whole and guarantees the proper communication and integration of all areas.

The assembly line of the MS21 Wing is now operational



RUSSIA

First wing of the MS21 in the 01.41 station.

The MS21 Wing Assembly Line was completed after a year of hard and joint work between MTorres and Aerocomposit teams.

■ ALL MTorres departments made a huge effort and addressed different type of unique set of challenges during the project. However, arming themselves with much patience and determination, MTorres managed to complete the line effectively and successfully. The end product was a perfectly manufactured wing.

On December 10th, 2015 the first MS21 Wing was completed by the 01.41 station and moved to station 01.43, which featured Panels and Spars manufactured by Torresdryfiber and Torresmill machines at Aerocomposit. A series of repeatability tests were carried out and Aerocomposit was highly satisfied with the results.

New 2D Integrated Torreslayup System

FINLAND

An essential contribution to provide consistently highest quality at lowest parts cost gained by a lower invest and increased productivity.

THE 2D TORRESLAYUP combines highest flexibility comprising of a number of High-Tech MTorres' standard components such as the highly reliable and most productive ATL head and a number of very beneficial optional components, functions and elements MTorres has developed within its very long experience in the field of automated lamination. However, the novelty is the light weight integrated gantry/vacuum table system that does not require any cost intensive foundation works.

It is the most attractive combination of a highly productive, supremely flexible and latest technologies combining MTorres' ATL system in the market when looking into the production of smaller sized 2D parts. Also, and besides the alluring lower cost for the machine itself, the overall investment to be looked at, including peripheral subjects such as costly foundation works, footprint and others, is reduced to

the minimum. The 2D TORRESLAYUP system completes the overall MTorres' portfolio of the already wide range of various TORRESLAYUP architectures. Besides 3D gantries, high rail and column systems as well as cantilever and robot based platforms, it was the only configuration in the



First 2D Torreslayup system delivered to PATRIA.

First Hybrid ATL-AFP Machine for Spirit Aerosystems

■ THE result of the continuous R&D efforts that MTorres makes to develop new solutions, as well as new products and additional capabilities to the existing products, lead us to develop what we call the Hybrid machine, which is a common machine platform, either gantry, cantilever, column or robotic architecture machine, capable of working either with a ATL head or an AFP head, and exchange one another within 90 seconds.

This capability boosts the flexibility of any given machine allowing the user to work with different technology head for different parts, for different aircraft programs or within the same part. Summarizing, this solution can do whatever is needed by the customer.

Spirit Aerosystems, which MTorres has had a long successful history, has been using our lamination equipment in production for years, quickly saw these advantages and decided to go with the acquisition of its first unit that has just been delivered.



USA

AFP Head.

Once the machine is up and running at their facility in Kinston, NC, Spirit will profit out of its high degree of flexibility laying A350XWB fuselage stringers using both ATL carbon or glass fiber tape for certain plies and AFP tows for others within the same part, optimizing both productivity and scrap ratio. This is the result of innovation.

broad range of ATL systems MTorres had offered, but had not been delivered to any customer until then.

MTorres has delivered this system to a new customer, PATRIA AEROSTRUCTURES O.Y. located in Finland.

Since then, and just within a very few months after the first contract signature, two additional and very relevant long term target references, GKN Munich and Austrian based company FACC, have decided to expand their fabrications with the MTorres 2D TORRESLAYUP system.

With all this new and important customers, we are increasing further our presence in new customers and new countries as well as the global network is strengthening our position in the European as well as in the full worldwide market.

Forty years of commitment together

■ WE are celebrating our 40th anniversary. 40 years of teamwork, the desire for continuous improvement and commitment to our ideas and projects have made MTorres a reference in the industry. 40 years of devoting significant resources to ongoing research, development and innovation. 40 years in which investment has enabled us to take on technological challenges, while always making the most of the experience and knowledge gained in our ongoing research work.

Our mission has always been to be pioneers in innovation; and our vision to become a global leader in technology. However, we have never lost sight of the values that have stayed with us from the beginning: innovation, commitment and teamwork.

Today we are 700 employees in the MTorres group, spread over many sites in Europe, America and Asia.