



Space

**Aeronautic
and Defence**

**Antennas and
Mechatronic**



SHAPING TECHNOLOGIES

Meet MT Aerospace, an international leader in technology, and one of Europe's top companies in its field. By shaping technologies, we mean not only our key role as a strong, reliable partner in many groundbreaking technology projects – from aerospace and defence, to ground structure applications. We also mean our strong commitment to demonstrate our outstanding engineering competence and experience to develop and manufacture “best-in-class” products that lead the way.



MT Aerospace's experience in the space industry goes back to its very start in Europe. Founded in 1969 as “MAN Technologie”, the Augsburg, Germany based company joined the ARIANE launcher programme only two years later.

Today, being a key member of OHB, MT Aerospace with its employees at locations worldwide is Germany's key partner in this flagship programme. This leading position in European aerospace supply is based on our core competencies in lightweight metallic and fibre composite components and subsystems. Furthermore, MT Aerospace has expanded these competencies with a far broader range of products and services that we would like to introduce throughout this brochure.

In the field of leading-edge technology, requiring highly customised solutions, working methods are a critical factor for success. MT Aerospace's approach stands out due to our highly recognised engineering expertise, as well as an industry-wide recognised reputation for dedication to innovation and state-of-the-art production technology. In combination with a fast-reacting mid-size

company's organisational structure this translates into close, very effective customer relationships and exceptionally quick turnaround times for technology implementation. We are fully committed to taking on the most ambitious challenges, knowing that they are vital to both our own quest for excellence as well as that of our customers.

MT Aerospace



Hans J. Steininger

Dr. Wolfgang Konrad



STRATEGY

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Building on our heritage as a leading technology company and competent partner in the space sector, MT Aerospace today provides design, development and production know-how to customers

around the world in the fields of Space, Aeronautics and Defence as well as Antenna and Mechatronic systems.

With our unique technology portfolio and expertise, our market position and our commitment to long-term growth, MT Aerospace will continue to pursue new markets and responsibilities.

Our key focus is delivering excellent services and products to our customers, providing innovative technology and expanding our presence in international markets.





INNOVATION

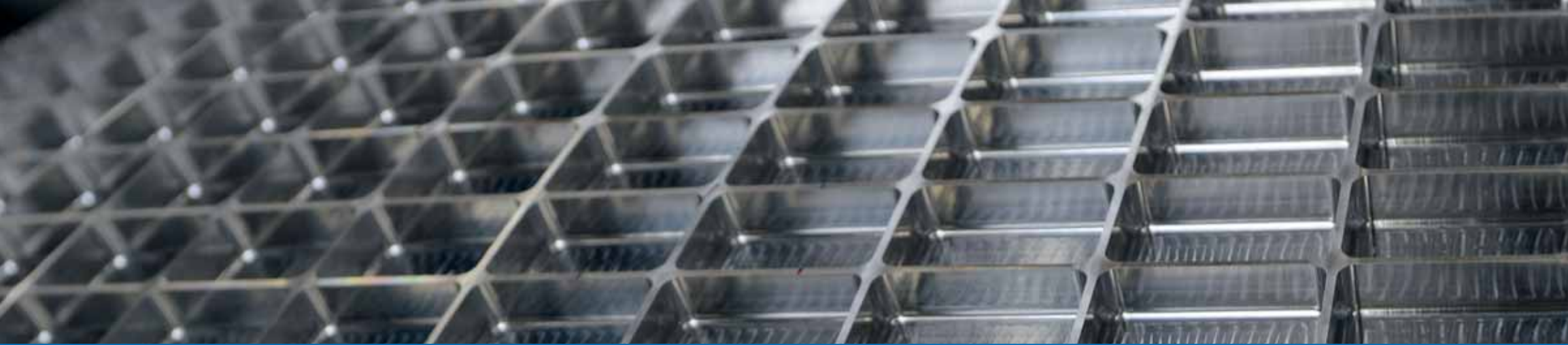
We at MT Aerospace believe in innovation as our key to strategic growth and continued success with our customers.

Innovation is anchored at the core of our organisation, meeting highest quality and efficiency standards while applying advanced materials across

our product portfolio, using the creativity and competence of our engineering and production experts to achieve innovative designs and production processes.

In cooperation with our research network of institutional and industrial partners, we invest in the early identification and selection of technology potentials as well as the rigorous assessment of quality and

performance capabilities to ensure that MT Aerospace continues to stand for leading technologies, satisfying highest customer standards.



EXCELLENCE IN PRODUCTS AND SERVICES

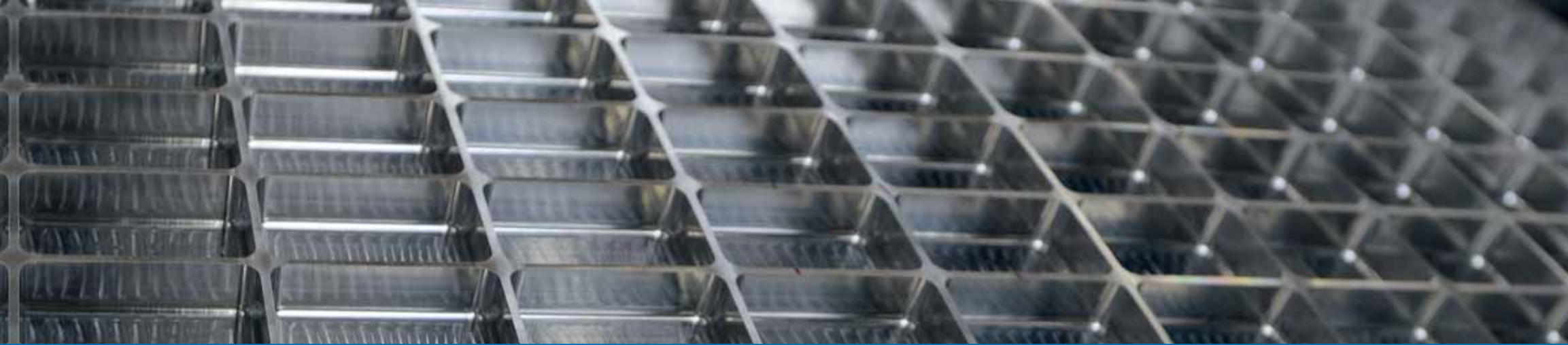
6 At MT Aerospace, we understand delivering services from a broad perspective, combining world-class engineering and manufacturing with quality and process leadership complemented by tailor-made service solutions. More than 40 years of successful partnerships

in key European aerospace programmes are the basis for our commitment to deliver nothing less than best-in-class products and services.

In the field of engineering, MT Aerospace is a widely recognised partner for the design and development of components and subsystems for launchers, satellites and aircraft. Our engineering know-how is based on comprehensive expertise in innovative layout, design and simulation methods. MT Aerospace's engineers draw on the full range of today's state-of-the-art design, analysis and system engineering tools. As a development partner at subsystem level, we develop, build and test complex structures and tanks for space and aeronautics applications, providing customised design and production solutions. Our design know-how includes the application of innovative materials, such as fibre reinforced composites, high performance alloys or ceramics, as well as advanced design and manufacturing technologies.

In manufacturing, our thorough experience in realising high-complexity and large-scale structures translates into globally unique manufacturing processes. Take for example the





MT Aerospace-developed counter roller flow forming for the ARIANE 5 booster cases or the spin-forming method, applied to produce large tank bulkheads and tank domes:

It is our deep understanding of the mission challenges that allows us to redefine the borders of light-weight design and efficient production. This also applies to MT Aerospace's pioneer role in the field of highly complex carbon fibre composite structures. Our leading market position is based on such distinctive manufacturing capabilities, integrated design methods and complex structure testing. We constantly invest in equipment and tooling as well as continuous process improvement to offer world-class manufacturing methods, including advanced milling, spin-forming and electron beam welding.

The commitment to deliver best-in-class products and services goes far beyond the doors of our design centres and production facilities. Integrated service solutions provided by MT Aerospace Guyane for the launch facilities at the European space port in Kourou, French Guiana, are just one example. Another is the comprehensive worldwide service portfolio of MT Mechatronics, our antennas and mechatronics division, covering the

entire project scope, from consulting and project management to operational support, training and maintenance.

Continuous excellence, rigorous quality commitment and highest customer satisfaction stands at the heart of our many long-term customer relationships. By constantly monitoring our internal processes, MT Aerospace's quality management ensures manufacturing processes of the highest level. We put forth our long-standing experience in the aerospace business, including outstanding maturity in development, qualification services and manufacturing of products. Process improvements also ensure highest health and safety standards as well as a standard-setting resource-friendly environmental policy.





SPACE

MT Aerospace is a major partner in many European space programmes and a recognised supplier worldwide. Our high precision products – the world’s largest satellite tank systems, solid rocket motor cases as well as large load carrying structures – are the key to successful space systems worldwide, launchers, transportation systems and satellites.

MT Aerospace builds on a long-standing heritage and unique competences in design, development, and manufacturing. From the first engineering studies to series production of flight hardware: We deliver quality and performance – every day.





SPACE PRODUCTS

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Producing world class design and applying manufacturing technologies for large complex tanks or structures, made from steel, aluminium, titanium, or composite materials – MT Aerospace is a leading supplier to the space industry worldwide.

Since 1986, MT Aerospace has developed and manufactured the steel cases of the ARIANE 5 boosters – one of the largest solid rocket motor cases in the space world. Each of the seven cylinders and two domes, joined to three segments of up to 11 metres tall, is manufactured to an accuracy of a few tenths of a millimetre by counter-roller flow forming – a globally unique process engineered by MT Aerospace.

For several different launchers and space infrastructures, MT Aerospace manufactures lightweight pressure bulk-

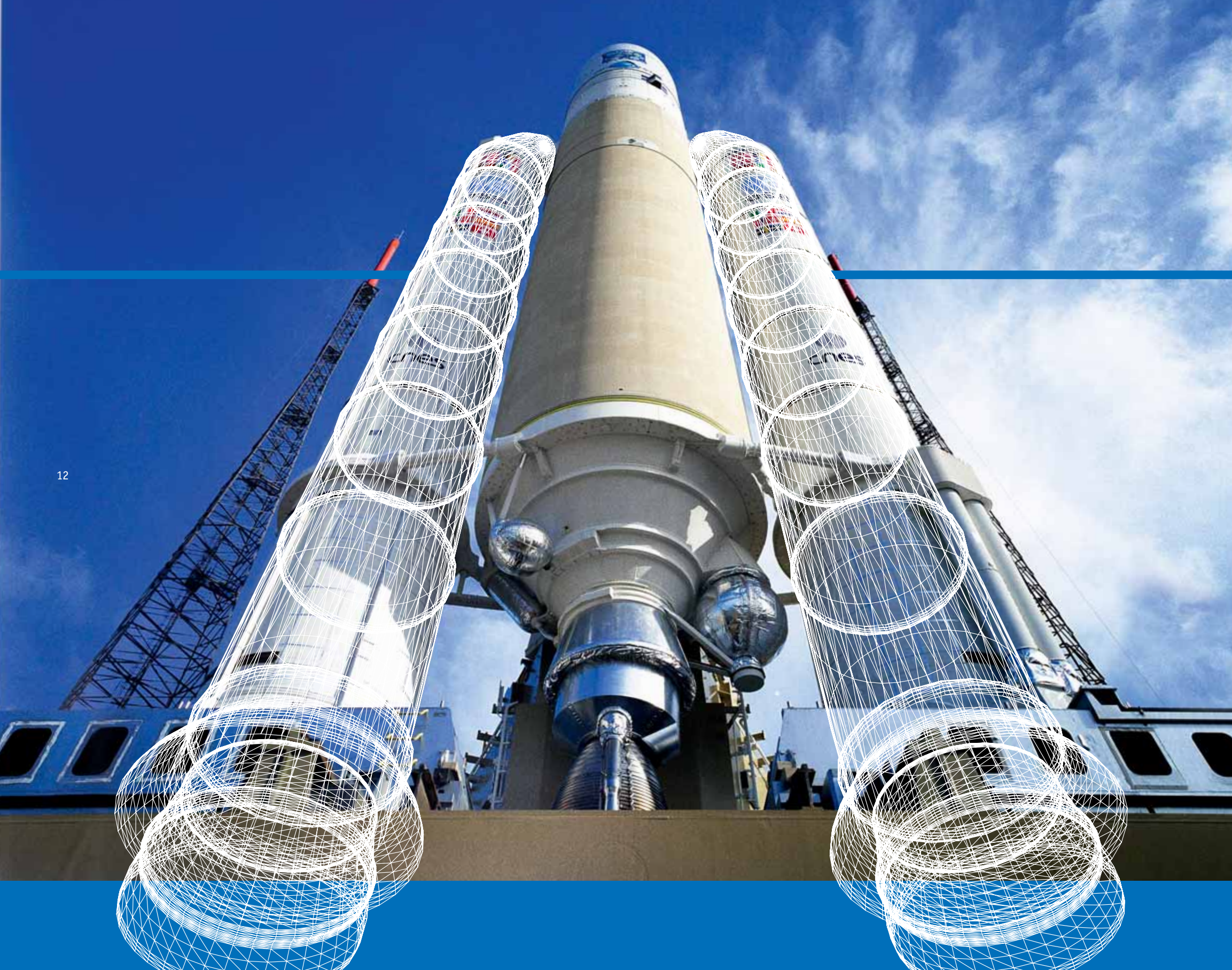
heads for propellant tanks and pressurised modules. These elements are manufactured by net-shape spin-forming from raw metal plates to spherical or elliptical domes up to 5.4 metres in diameter in a single production step requiring no further machining to meet final specifications.

MT Aerospace and its subsidiaries supply propellant tanks for more than 20 percent of the world's satellite fleets, among them the current Eurostar platform as well as European scientific satellites. The satellite propellant tank for the new Alphas platform – one of the largest satellite tanks ever made – is engineered, designed and manufactured by MT Aerospace. A new generation of extremely lightweight design tanks, with a carbon fibre overwrap and a titanium liner, combines our unique know-how and technological heritage in propellant and pressurised tanks.

For Europe's Automated Transfer Vehicle which supplies the International Space Station, MT Aerospace developed and manufactures key elements, such as the thruster module, tanks for water, gas and propellants, as well as the water and gas delivery system.

Lightweight fibre ceramic composite materials, developed and patented as Keraman® by MT Aerospace demonstrate outstanding quality in extreme environments, temperatures and loads for space, aeronautic and industrial applications, withstanding a temperature span from 1800 degrees Celsius down to less than minus 250 degrees Celsius. MT Aerospace provides tailored layout, design and processes for its fabrication.







ARIANE 5

ARIANE 5 is today's leading commercial launch system worldwide. MT Aerospace, as the largest manufacturer outside France and a service provider to the European Space Port in French Guiana, contributes to the reliability and competitiveness of the ARIANE launch system.

Around 10 percent of each ARIANE 5 launcher is manufactured at our Augsburg plant, including the solid rocket motor cases, cryogenic tank components, complex load-carrying structures, propellant tanks, pressure vessels, and thermal protection subsystems.

Since the very beginning of the European launcher programme in 1973, MT Aerospace has been a leading partner in the ARIANE industry. To deliver highest quality and performance is our commitment to Europe's access to space – today and in the future.



AERONAUTIC AND DEFENCE

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Lightweight design and low maintenance costs are the key drivers for the design and development of future aircraft, reducing fuel consumption and overall airline transportation cost. MT Aerospace provides customised design and manufacturing solutions for carbon fibre composite structures for aeronautics and defence applications. From parts to subassemblies, we deliver one-stop solutions covering design, development, and manufacturing services.

Together with our customers, we are continuously working on optimised solutions providing lowest cost and weight as well as highest efficiency. Continuous investment in new technologies and skills and the systematic development of worldwide partnerships enables us to deliver most economical solution to our customers.







AERONAUTIC AND DEFENCE PRODUCTS

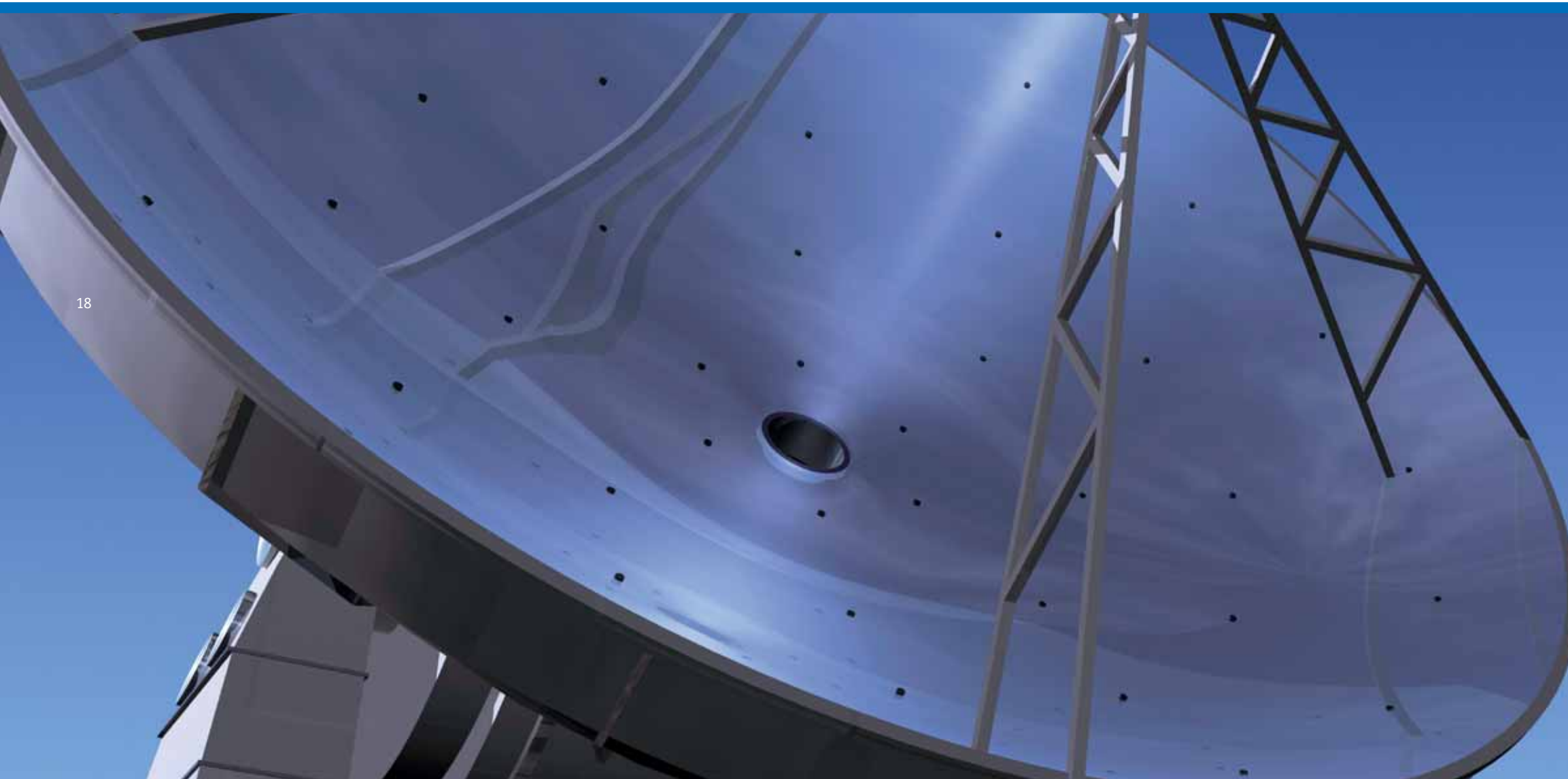
Lightweight aeronautics structures from composite materials are revolutionising future aircraft designs. MT Aerospace delivers solutions for design to build contracts focussing on small and mid-size structural parts, such as fairings, floor beams and tail cones, designed with carbon fibre reinforced plastic materials.

Our products range from complex structures manufactured in monolithic pre-preg or infusion technology to cylindrical or spherical structures manufactured by wet winding and automated fibre placement.

For more than 20 years, we have been a leading supplier of potable water and waste water tanks for Airbus, Embraer and Dassault, having so far delivered more than 9,000 water tanks. With our maintenance free tank design we support airlines in reducing recurrent maintenance cost throughout their lifetime.

Highly agile missiles, the backbone of an efficient air defence system, require casing structures with a supreme mass-to-stiffness ratio. Our competence in filament winding technology and knowledge of ablative material makes us the partner of choice for the defence industry.





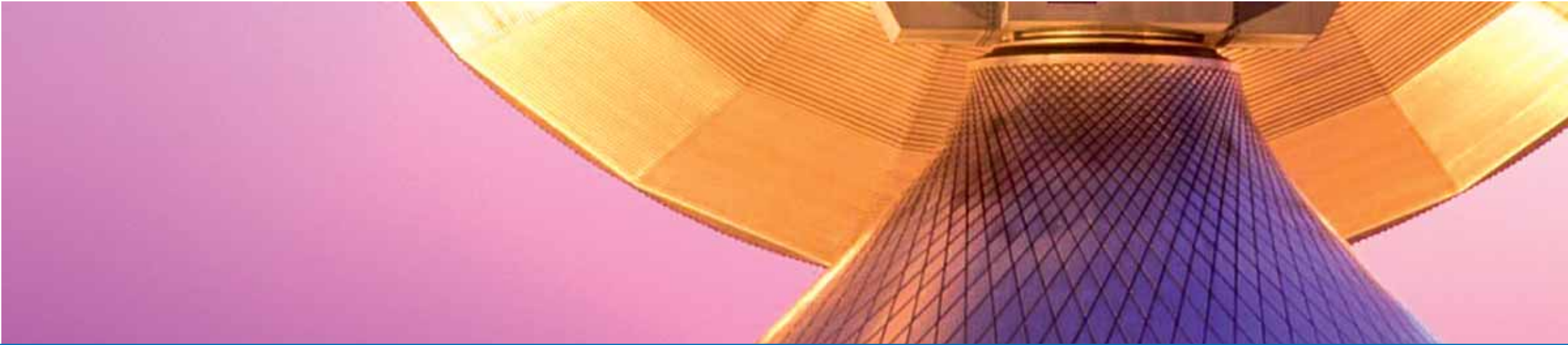


ANTENNAS AND MECHATRONICS

Through our subsidiary MT Mechatronics in Mainz, Germany, and its experts working next to our clients at locations across the world, we develop and deliver turnkey solutions for communication antennas, radio and optical telescopes, as well as mechatronic equipment for research institutions.

MT Mechatronics provides global services as a prime contractor for design, development, system integration, commissioning, continuous training and maintenance.

We also apply our know-how in the development of customised large-scale medical installations and recently delivered a 670 tons gantry for the precise positioning of proton and heavy ion beams for cancer treatment.



ANTENNAS AND MECHATRONIC PRODUCTS

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As a supplier for turnkey solutions for large antennas and telescopes, our services include system integration, commissioning, testing and training. We offer a broad product spectrum: High-end applications for state of the art scientific radio telescopes, optical telescopes, and airborne telescope applications, as well as antennas for satellite control and data exchange.

In smart lightweight structures, our long-standing experience enables the design and construction of precise large and highly sophisticated structures, which are moved under the influence of gravity and inertia. Dedicated struc-

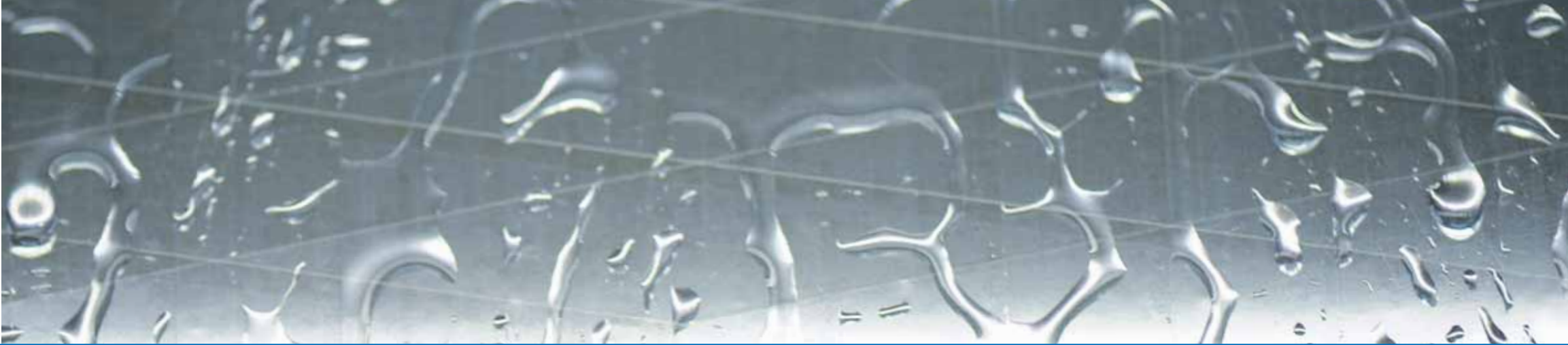
tural design, use of advanced materials, and active deformation control are the main features of these systems. Applications range from supports for telescope reflectors and mirrors to smart structures using flexible body control.

Recently, the worldwide first and unique gantry was successfully taken into operation at the Heavy Ion Cancer Therapy facility in Heidelberg, Germany. We delivered the turnkey high precision positioning system for the ion beam as well as the treatment room area including safety technology required by medical standards.

Based on our expertise in all engineering disciplines, we offer applications for many other product families, such as positioning systems, test and simulation facilities, active reflector surfaces, high accuracy heavy load hexapods, vibration compensation and thermal control systems.

Conceptual and design studies, system simulation, assessments and project management consulting round off our product engineering services.





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A close-up photograph of numerous water droplets of various sizes on a dark, reflective surface. The droplets are illuminated from the side, creating bright highlights and deep shadows. A solid blue horizontal bar runs across the top and bottom of the image.

SHAPING TECHNOLOGIES



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