Oerlikon Space – the former Contraves Space – is recognised as a leading solution provider for its demanding world-wide space customers. The company’s acknowledged expertise in the areas of international project management, system engineering and design, material and process qualification as well as manufacturing, testing and quality assurance make Oerlikon Space one of the leading medium size space companies in Europe. All required test facilities (material testing, static load testing, dynamic and environmental testing) are available on the Oerlikon Space premises.

Oerlikon Space has been active in structural engineering since the mid 60’s. Through the many years of successful activity the company has gained extensive know-how in the design, manufacturing and testing of lightweight space structures utilising a variety of technologies. Oerlikon Space’s competencies have been demonstrated by the supply of more than 45 spacecraft structures for the European Space Agency ESA and over 180 payload fairings built for European and US customers.

In the frame of the new European SatCom programmes AlphaSat and Small Geo, Oerlikon Space has been nominated in 2007 as a major partner and is responsible for the spacecraft structures and other sub-systems.

Our References for Spacecraft Structures within in the European Space Agency (ESA) Programmes:

- ERS-1, ERS-2, Jason-1, Envisat, Metop, Galileo, BepiCko, OSIRIS-REx, Cluster, ASAR, AEGIS, SMOS, LISA Pathfinder, AlphaBus, Small GEO Satellite
- Payload Fairings for Launch Vehicles
- Spacecraft Structures
- High Precision Mechanisms
- Scientific Instruments
- Electro-Optical Systems

Located in Zurich/Switzerland, Oerlikon Space incorporates the complete infrastructure needed for the space business and employ approx 300 staff, around half of whom are highly qualified engineers.

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Oerlikon Space is well known in the international space business and your reliable partner for:

- Payload Fairings for Launch Vehicles
- Spacecraft Structures
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Large Lightweight Spacecraft Structures

Oerlikon Space – the former Contraves Space – is recognised as a leading solution provider for its demanding world-wide space customers. The company’s acknowledged expertise in the areas of international project management, system engineering and design, material and process qualification as well as manufacturing, testing and quality assurance make Oerlikon Space one of the leading medium size space companies in Europe. All required test facilities (material testing, static load testing, dynamic and environmental testing) are available on the Oerlikon Space premises.

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Our References for Spacecraft Structures within in the European Space Agency (ESA) Programmes:

- ESRO 1, 2, 3; JAVO; Selex Optics; Giotto; EDRS 1, 2, Spotmail 2000; SIRIO; Cluster ASAR Antenna Structure for ENVISAT; Huygens, XMM, Integral, Metosat 2nd Generation, METOP; Automated Transfer Vehicle ATV for ISS; Mars Express, CryoSat, Cryo and Telescope Structure for PLANCK; Venus Express, ADM, Aeolus, SMOS, LISA Pathfinder, AlphaBus, Small GEO Satellite

Company Activities

Oerlikon Space, Switzerland’s largest space technology company, is one of the leading European suppliers of systems and subsystems for space applications. Faithfulness and customer orientation are the keys to the company’s lasting success on the European and the American space market. Oerlikon Space has at its disposal a broad range of engineering capabilities for mechanical, optical, electronics and software design, development, production and testing of complex systems for space applications.

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Project Management
The management of large and complex international space projects is one of Oerlikon Space’s proven strengths. The Company was responsible for the design and development of the International Space Station which is currently under production at Oerlikon Space in collaboration with four subcontractors based in Germany, Spain and Switzerland, and a large number of individual suppliers. Within such a large programme, involving an international development team, Oerlikon Space has demonstrated the Company’s system management expertise. Since 2003 Oerlikon Space is a key development partner in the new European space program “Small GEO” and gains a foothold in another lucrative market for small telecommunications satellites.

Engineering
Oerlikon Space has extensive experience gained in more than 40 years of activities in aerospace programmes. The necessary tools and techniques for the development and complete definition of a structure of all kinds with a special emphasis on composite materials are available. The engineering and design teams are carried out from the initial conceptual design phase up to the establishment of detailed documentation for manufacturing, verification and operations of a matured product.

Our main capabilities in structural analyses are:
- Static of the art FE modelling
- Global stress
- Stability
- Detailed stress
- Design variability
- Optimisation
- Fatigue and fracture control
- Thermal and thermo-mechanical
- Mechanism kinematics

Oerlikon Space engineers work with today’s main Software packages such as:
- CATIA
- VDA-SP1000
- IDEAS Master Series
- ANSYS
- MATHCAD
- ESATAN
- ESAC/CMP

Technology: Material/Process Qualification
Although the company disposes of a wealth of material and process data from former successful programmes, Oerlikon Space executes specific material and process qualification programmes for new demand. This allows fulfilling the challenging expectations of our customers.

For the Agency’s Plans to produce a wide range of new materials and processes were developed and tested in order to guarantee their flawless performance at the required -24°C / cryogenic temperature.

Manufacturing
At Oerlikon Space, all facilities required for the manufacture of lightweight structures such as composite or metallic sand castings, integrally stiffened composite, full metallic structures are available.

For example, during sandwich panel manufacturing in process samples are produced, i.e. identical material and process, to verify the quality of the manufacturing.

Testing and Qualification
Our main facilities are:
- Composite materials workshops
- Large assembly and Integration facilities
- Adhesive bonding laboratory
- Anvil (up to 4 m in diameter)
- Press process
- Press 1000 x 1000 mm
- Several CNC machining centres (6 axes, up to 6000 x 3000 x 1000 mm)
- Parking workshop

Furthermore Oerlikon Space dispose of facilities for all kind of mechanical loads up to large scale structures qualification:
- Two static load test facilities (15 x 15 x 15 m and 5 x 5 x 5 m)
- Two electrodynamic shakers
- Thermal vacuum chamber
- Coordination of external test facilities

Oerlikon Space is capable of managing programmes with subcontractors and suppliers in a complex development environment. Network based information management with all involved partners is supplied and modern software tools such as COCOM and CRAM/LE are in use.

Oerlikon Space is ISO 9001, rev. 2000 certified company accredited by national organisations in CH, F, DE, GB, USA, conforms to EN9100 and has a process-integrated Product Assurance Management System reporting directly to the CEO. Furthermore a comprehensive product assurance plan tailored to the customers’ needs is established and closely monitored.

S/C Structures: From Design to Qualification... and Flight
Structural systems are required for space missions in many different forms, be it for spacecraft structures, heat shields or optical benches. In addition, thermal and stability requirements cover a wide range typical for the specific application.

Dimensionally Stable Structures
The term dimensionally stable structures refers to optical benches, where the mechanical stability of the structure is tightly linked to the optical system’s performance.

Cryogenic Structures
The operational temperature of a scientific spacecraft may range from -20°C to -220°C. To this end, special materials and processes have been qualified to guarantee the expected mechanical, thermal and radiative properties of the structure.

Intelligent Structures
The term intelligent structures refers to structural technologies which combine the required mechanical properties with the equipment needed to monitor and measure the thermal and mechanical loads the structure experience in its lifetime.

Large Structures
Oerlikon Space has built the majority of the structures for the Agency’s scientific spacecraft and contributed to many spacecraft systems of ESA’s Earth observation spacecraft. Special structural subsystems like for example the INTEGRAL, or METOP Payload Module structures or the Hughes Thermal Insulation are covered by this term also.
S/C Structures: From Design to Qualification...

Manufacturing

At Oerlikon Space, all facilities required for the manufacture of lightweight structures such as composite or metallic sandwich, integrally stiffened composites, full metallic structures are available.

For example, during sandwich panel manufacturing in process samples are produced, i.e. identical material and process, to verify the quality of the manufactured items.

Furthermore Oerlikon Space disposes of facilities for all kind of destructive and non-destructive material tests from component to large scale structures qualification. Furthermore Oerlikon Space disposes of facilities for all kind of destructive and non-destructive material tests from component to large scale structures qualification.

Testing and Qualification

Our main facilities are:
- Large assembly and integration facilities
- Assembly and alignment (up to 4 m diameter)
- Assembly and integration benches (5-axis, up to 6000 x 3000 x 1000 mm)
- Several CNC machining centres (5 axes, up to EOS D 3000 x 1000 mm)
- Parking workshop

Testing...

manufacturer...
Project Management

The management of large and complex international space projects is one of Oerlikon Space’s strengths. The company was responsible for the design and development of the International Space Station's Automated Transfer Vehicle ( ATV) for the International Space Station which is currently under production at Oerlikon Space in collaboration with four subcontractors based in Germany, Spain and Switzerland, and a large number of individual suppliers. Within such large programs, involving international development teams, Oerlikon Space has demonstrated the Company’s system management expertise. Since 2007 Oerlikon Space is an important development partner in the new European space programme “Small Satellites”, demonstrating the Company’s system management expertise. The management of large and complex international space projects is one of Oerlikon Space's proven strengths. The necessary management of large programmes for new demand packages such as:

- INTEGRAL
- Module structures for the Agency's scientific spacecraft and contributed to many structural systems of ESA's Earth observation spacecraft.
- Cryogenic Structures

Structural systems are required for space missions in many different forms, be it for spacecraft structures, heat shields or optical benches. In addition, thermal and stability requirements cover a wide range typical for the specific application.

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The term dimensionally stable structures refers to optical benches, where the mechanical stability of the structure is tightly linked to the optical system’s performance.

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S/C Structures: From Design to Qualification...

Engineering

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Our main capabilities in structural analyses are:

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- Robust FE models
- Stress analysis
- Dynamic response
- Stability
- Detailed stress
- Design variability
- Optimisation
- Fatigue and fracture control
- Thermal and thermo-mechanical
- Mechanism/kinematics

Oerlikon Space is engaged in the development of advanced materials and processes which combine the required mechanical properties with new, innovative and embedded technologies.

- Cryogenic Structures

The operational temperature of a scientific spacecraft may range from +240 °C to -240 °C. To this end, special materials and processes have been qualified to guarantee the expected mechanical, thermal and radiative properties of the structure.

- Intelligent Structures

The term intelligent structures refers to structural technologies which combine the required mechanical properties with new, innovative and embedded technologies.

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- Testing and Qualification

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- Manufacturing

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