Oerlikon is a leading global technology Group providing market-leading technologies and services. The Group is structured in three Segments: Surface Solutions, offering solutions from ultrathin high-performance coatings for tools and precision components to thick-layer coating technologies; Manmade Fibers, providing solutions for the manufacture of high-quality manmade fibers and polycondensation systems; Drive Systems, developing customized drive solutions and components for high-performance sports cars, electric and hybrid cars, off-highway vehicles and industrial applications.

Innovation as the driving force

A Swiss company with a tradition going back over 100 years, today Oerlikon is a global player with over 13,500 employees at more than 170 locations in 37 countries, striving to be the most reliable business partner and continuously creating long-term values and innovative industrial solutions for a better life.
Worldwide leader in gearing and Shifting Solutions™ Drive Systems Segment is one of the world’s largest and global manufacturer of custom gears and shafts, especially for agricultural, off-highway, industrial and power generation markets and is the world leader in the design, development and manufacture of Shifting Solutions™ (synchronisers and powershift clutches) used within the agricultural and off-highway applications.

The global player in off-highway systems Drive Systems Segment is leader in the manufacture of axle and planetary drive solutions for the off-highway market, the preferred partner in designing, testing and manufacturing of driveline and planetary drive systems for a variety of special applications in construction and mining, agriculture, off-shore marine and specialty industrial sectors.

Global drive systems provider Drive Systems Segment maintains engineering and manufacturing expertise to develop gear driven solutions for the propulsion or rotation of mobile vehicles or industrial equipment, standing out as a provider with a global production network, broad geographical coverage and a high-tech and comprehensive product range for various markets and applications.

Leader in high performance automotive, hybrid and electric vehicle applications Drive Systems Segment is market leader in high performing transmissions, operating in -tor and concentrating on vehicles that are set aside from the mass by unique features, ranging from those of a sports nature to versatility of use on harsh terrain, to “zero” or extremely reduced emissions of pollutants.

Automotive product line includes manual, automated manual and dual clutch transmission systems for high and very high-performance sports cars; transmission units (power transfer units and differentials) for 4-wheel drive vehicles and driveline assemblies for full electric and hybrid vehicles.

Under Drive Systems Segment, Oerlikon Graziano and Oerlikon Fairfield are the leading worldwide provider of complete drive systems, gearing solutions and single components for transmissions, with a product portfolio including applications for agricultural vehicles, high-performance sports cars and solutions for the construction, energy and mining industries.
Global drive systems provider
Under Drive Systems Segment, Oerlikon Graziano and Oerlikon Fairfield are the leading worldwide provider of complete drive systems, gearing solutions and single components for transmissions, with a product portfolio including applications for agricultural vehicles, high-performance sports cars and solutions for the construction, energy and mining industries.
Drive Systems Segment maintains engineering and manufacturing expertise to develop gear driven solutions for the propulsion or rotation of mobile vehicles or industrial equipment, standing out as a provider with a global production network, broad geographical coverage and a high-tech and comprehensive product range for various markets and applications.

Drive Systems Segment

Leader in high performance automotive, hybrid and electric vehicle applications
Drive Systems Segment is market leader in high performing transmissions, operating in very specific segments of the automotive sector and concentrating on vehicles that are set aside from the mass by unique features, ranging from those of a sports nature to versatility of use on harsh terrain, to “zero” or extremely reduced emissions of pollutants. Automotive product line includes manual, automated manual and dual clutch transmission systems for high and very high-performance sports cars; transmission units (power transfer units and differentials) for 4-wheel drive vehicles and driveline assemblies for full electric and hybrid vehicles.

Worldwide leader in gearing and Shifting Solutions™
Drive Systems Segment is one of the world’s largest and global manufacturer of custom gears and shafts, especially for agricultural, off-highway, industrial and power generation markets and is the world leader in the design, development and manufacture of Shifting Solutions™ (synchronisers and powershift clutches) used within the agricultural and off-highway applications.

The global player in off-highway systems
Drive Systems Segment is leader in the manufacture of axle and planetary drive solutions for the off-highway market, the preferred partner in designing, testing and manufacturing of driveline and planetary drive systems for a variety of special applications in construction and mining, agriculture, off-shore marine and specialty industrial sectors.
Oerlikon Graziano assembled its first automotive transmission in the 1997. After years of success and excellent results, today the company is world's no. 1 in design, development and supply of manual/automated manual transmission systems for small/medium series high performance cars and key player in applying innovative technologies, as the Dual Clutch Transmissions, 7-speed AMTs to premium performance cars, electric and hybrid transmissions for passengers cars and commercial vehicles.

The high performing transmissions sector requires to constantly present new ideas and concepts to OEMs, in order to enhance the overall performance of their vehicles. Cars with high performance demand the best in all components. Advanced transmission systems such as AMTs, DCTs and their hybrid evolutions, active torque distribution systems and multispeed electric drive transmissions require sophisticated control systems. In order to be able to offer to the customers a full “turn-key” service, Oerlikon Graziano has developed high capabilities in these advanced solutions, in particular in the electronic and control area, also thanks to the cooperation with the controlled UK company VOCIS, specialised in transmission and driveline control system engineering.

In the last 20 years Oerlikon Graziano has also acquired an excellent experience in the “electric and hybrid driveline assemblies product line”. The products go from the very first golf/utility transaxle to single and multi-speed transmission systems developed for vehicles ranging from the ever more popular and fancy “full electric zero emissions” city cars, to light commercial electric vehicles, to exotic full electric and hybrid sports cars.
Research & Development

Oerlikon Graziano is responsible for the development and the production of a wide range of transmissions, acting as Tier 1 full system supplier for complex driveline systems in automotive, off-highway and shifting solutions fields.

Oerlikon Graziano has internal capabilities to fully develop complex systems including the “base transmission”, that is mechanical design (FMEA, CAD, FEM, dynamic modelling, modal analysis), prototype manufacturing with dedicated machines, prototype assembly in controlled environment and testing (functional, structural and synchronizer tests, lubrication analysis on programmable tilting rig, under load contact pattern, NVH measurement, climatic test with temperature profile from -40°C to 120°C).

Oerlikon Graziano competences include also hydraulic and controls/calibration skills, thanks to the cooperation with VOCIS.

Oerlikon Graziano is actively working on EC funded programs and prepared several papers presented in the most renowned congress and symposia (SAE, CTI, AVEC, IEEE). As member of GearLab (Ohio University), it has also access to the up to date SW for gear analysis as well as regular contacts with the community of gear manufacturers.

Active cooperation with Surrey University (UK) and Italian Universities (Turin, Milan, Modena, Reggio Emilia and Naples) are in place, and a sponsorship is granted to Uninauto Master, a post-degree master in vehicle engineering from University of Naples.
Gearboxes for high performance cars - world’s no. 1 in development and supply of manual and automated manual transmission systems for small/medium series high performance cars and key player in applying innovative technologies (Dual Clutch and Automated Manual Transmissions with their hybrid derivatives). These are six and seven speeds units, designed for either particular requirements of the individual car.

Transmission units for 4-wheel drive vehicles: PTUs (power transfer units), RDAs (rear drive axles) and RDMs (rear drive modules) for AWD, RWD (Rear Wheel Drive) performance applications and angle drives for performance motorbikes.

Driveline assemblies for full electric and hybrid vehicles popular and fancy “full electric” and hybrid city and high performance cars, the market of the future.
High performance solutions

**Gearboxes for high performance cars** - world’s no. 1 in development and supply of manual and automated manual transmission systems for small/medium series high performance cars and key player in applying innovative technologies (Dual Clutch and Automated Manual Transmissions with their hybrid derivatives). These are six and seven speeds units, designed for either front engine rear transaxle configurations or mid-engine ones, and are specifically tailored to the particular requirements of the individual car.

**Transmission units for 4-wheel drive vehicles**: PTUs (power transfer units), RDAs (rear drive axles) and RDMs (rear drive modules) for AWD, RWD (Rear Wheel Drive) performance applications and angle drives for performance motorbikes.

**Driveline assemblies for full electric and hybrid vehicles**, ranging from the very first golf/utlity transaxle to the latest extremely innovative hybrid AMT concept with torque infill. The latest hybrid solutions offer opportunities of efficiency improvement and consumption saving, to be applied to the popular and fancy “full electric” and hybrid city and high performance cars, the market of the future.
Since its foundation in 2006, VOCIS, a company formed by a nucleus of highly experienced engineers has grown from 5 to 29 employees as well as in stature within the industry. The combination of Oerlikon Graziano’s expertise in the design and manufacturing of high performance transmissions, with Vocis’ unique talent in controls techniques - looked perfect. Both sides could see the advantages of a close connection, and shortly after forming, Oerlikon Graziano took a controlling interest in VOCIS.

VOCIS specialises in Control & Hydraulic System Engineering and Programme Management for the automotive industry. The founders together with the other Technical Specialist at Vocis are widely experienced in delivering challenging and high value automotive programmes for a variety of high profile OE customers, Tier One Suppliers and Design Consultancies. More than 180 man years’ experience is held in all aspects of mechanical and software control for DCT, AMT, CVT, AT transmissions, EV / Hybrid drive systems and active torque management systems.

VOCIS is forging ever closer links with Oerlikon Graziano and expanded its own range of capabilities. In addition to larger premises it now also possesses a large development facility at MIRA, one of the UK and Europe premier test track and vehicle development centres. OEM project vehicles and a joint Oerlikon Graziano – VOCIS research project are currently based at MIRA. VOCIS is working both with Oerlikon Graziano and on its own with several major OEM and Tier 1 programmes and is making a significant contribution even to the most advanced development programmes.

The highly flexible and versatile VOCIS SIENA transmission s/w platform, entirely developed in-house, forms the basis for a significant element of many customer transmission systems...
programmes. Along with the VOCIS TMS-20 transmission control unit SIENA has also proved to be an invaluable asset on many customer projects from first concept stage. Accelerated development progress has been achieved using this compact, cost effective and production representative control unit and robust and production validated SIENA s/w. The TMS-20 is now in its 4th hardware generation and along with SIENA s/w, both will continue to be under constant development to keep them at the cutting edge of transmission control technology. Vocis has recently added a new CAN based high speed data logger @ its TMS-6 motor controller.

In October 2011 Vocis was awarded Consultancy of the Year by the British Engineering Excellence Awards (BEEAs). In November 2012 Vocis was runner up in the prestigious SMMT Innovation Award with its 4SED - 4-speed seamless shift EV transmission.