SIEMENS

NX • Tecnomatix

# Sila Holding Industriale

## Designing gear shifters for optimum efficiency and ultimate comfort

**Industry**

Automotive

**Business challenges**

Developing new gear shifters in a dynamic industry

Increasing market presence worldwide

Delivering the highest quality products – aesthetically, ergonomically and functionally

**Keys to success**

NX Motion Simulation-RecurDyn for kinematics analysis

Tecnomatix VSA for the calculation of tolerances

Easy-to-use software supported by meaningful training and assistance

**Results**

Optimal product design configurations; greater innovation

Potential problems defined, checked and controlled before the prototype stage

### NX and Tecnomatix provide the right combination for maximum aesthetics, ergonomics and performance for this growing global automotive supplier

**Going global**

Sila Holding Industriale S.p.A. produces components for passenger and industrial vehicles. Sila Group employs approximately 1,600 employees worldwide, with four hundred people in three Italian plants and the remaining personnel in facilities throughout Turkey, Poland, Morocco, Brazil and Argentina. Some 70 percent of the group's annual revenue, about €140 million in 2008, is derived from the production of gear shifters for cars, mainly manual transmission push-pull cables.

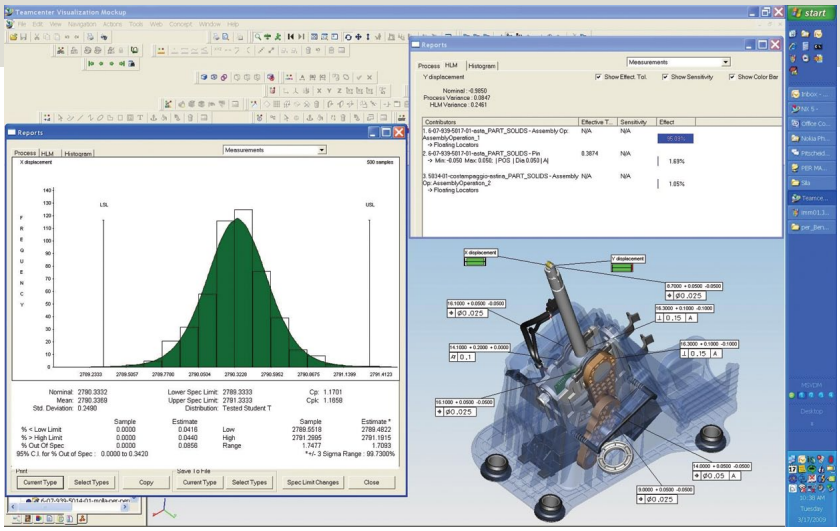
The company's Department of Research and Development (R&D), located near Turin, is continuously working on introducing highly innovative technological solutions, such as the application of a new easy-to-install electro-activated robotized transmission system. Sila Holding Industriale is intent on delivering its innovations on an ever-increasing global scale, as demonstrated by its recent joint venture with the Indian company SKH Metal. "With sales of about 3.5 million transmission controls, we have a good position on the world market, which on the whole, represents about 70 million individual pieces," says Guido Panizza, R&D manager and technical director, Sila Holding Industriale.

Panizza adds, "Research and Development is currently working on the creation of by-wire controls for automatic, robotic, dual clutch and CVT transmissions."

**Elements of a good system**

Designing outstanding gear shifters means bridging a unique set of requirements. Panizza explains, "The product represents the typical man-machine interface. It must satisfy aesthetic prerequisites and ergonomic necessities – it must be easy to use for drivers. At the same time, the control is linked to the heart of the machine, to the transmission, to the engine compartment – critical areas for noise and vibration harness."

Therefore, it is essential that the vibrations of the engine and of the engine-transmission group be de-coupled from the passenger compartment. The link between



## Results *(continued)*

Increasingly greater flexibility in design processes, assured by the integration of CAD functionalities with kinematics analysis and the calculation of tolerances

**"In our design environment, we work 99 percent with Siemens' software. Among the various benefits we've found, we are especially pleased with the easy interfaces employed by Siemens' technology, easy-to-use features and quick response time. The fact that with only one software solution we can integrate CAD with kinematics analysis and the calculation of tolerances is strategic and crucial, because it confers increasingly greater flexibility for our development processes."**

Guido Panizza,
R&D Manager and Technical Director
Sila Holding Industriale S.p.A.

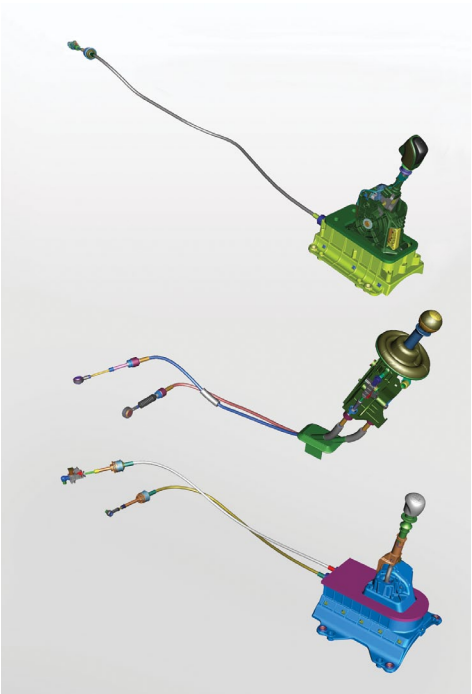
these two mainly consists of a lever, which has its fulcrum in a housing. In 99 percent of the cases, the housing is made of plastic connected to flexible push-pull cables, which are in turn connected to the gearbox. Panizza explains, "The housing, which must be solid, is essential. A good system presents very low friction, because the effort required by the driver must be minimal, and it must factor in the maneuverability of the levers of the transmission on the gearbox. It is necessary for the system, therefore, to be sufficiently rigid – it must not give in. At the same time, it must be able to absorb all vibrations, with none reaching the passenger compartment. In addition, the control must be comfortable, that is, easy for the driver to shift and providing the feeling of accuracy when selecting a gear."

Panizza describes the key to design success: "The main parameters for creating an excellent system therefore are those relating to mechanical resistance and kinematics. For the optimal development of the transmission control, efficient system kinematics analyses are particularly important as the movement of the driver is translated into an accurate movement of the flexible push-pull cables, which assures the immediate and fluid selection of the gears."

### Increasing design options, reliability

"Our partnership with Siemens PLM Software began in 2001," says Panizza. "One of the reasons we selected Siemens is our need to precisely interact with clients, who addressed their product development needs using Unigraphics (renamed NX™) software from UGS, now Siemens PLM Software. Over time, we have introduced progressive versions of NX. To meet our specific development needs, we acquired NX Motion Simulation. Within our development activities, kinematics is not limited to the need to ward off interferences between the knob and the passenger compartment. It is critical in assuring the correct movements of the system, even before the prototype stage. NX is regularly used by our 25 designers to deliver innovation to our gear shifters development process."

The use of simulation to analyze the functional behavior of parts and assemblies in the initial stages of the product development process significantly increases the number of design options that can be



### Solutions/Services

NX
www.siemens.com/nx

Tecnomatix
www.siemens.com/tecnomatix

### Customer's primary business

Part of Sila Group with operations in Turkey, Poland, India, Morocco, Brazil and Argentina, Sila Holding Industriale S.p.A. works as a direct supplier of gear shifters (manual and automatic) and pull cables for major automotive manufacturers, including BMW, Mercedes, FGA, PSA and Toyota

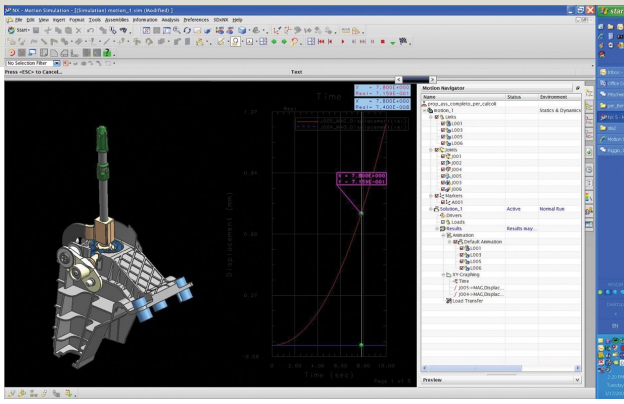
### Customer location

Orbassano, Turin (TO)
Italy

assessed as well as substantially improves the reliability of the results. The capabilities Sila Holding Industriale finds most beneficial are found in NX Motion Simulation, which provides a series of complete and reliable tools for helping the company's designers and engineers predict and understand the functional behavior of parts and assemblies, supporting all aspects of advanced, dynamic and kinematics motion simulation.

### Controlling tolerances

Sila Holding Industriale finds Siemens' Tecnomatix® digital manufacturing technology the best choice when it comes to tolerances. The company employs Tecnomatix Variation Analysis, a dimensional analysis tool used to simulate manufacturing and assembly processes and predict the amounts and causes of variation, for the calculation of tolerances. Panizza notes, "Support for the calculation of tolerances is very important in the development of a system, which is made up of a series of components connected one to the other, because it helps establish the correct design for potentially dangerous couplings, controlling any harmful interactions. No matter what type of transmission is involved, using Tecnomatix, we are able to control it." Panizza notes that Tecnomatix allows his team to foresee the



consequences of the variations, significantly reducing costs and accelerating the launch time of new products.

"In our design environment, we work 99 percent with Siemens' software," says Panizza. Among the various benefits we've found, we are especially pleased with the easy interfaces employed by Siemens' technology, easy-to-use features and quick response time. The fact that with only one software solution we can integrate CAD with kinematics analysis and the calculation of tolerances is strategic and crucial, because it confers increasingly greater flexibility for our development processes. We also put a high value on the frequent refresher courses Siemens offers, which we've found to be very meaningful for our specific needs."

### Greater collaboration on the horizon

Panizza describes the company's next steps: "We are continuing to invest in R&D and we will not stop. We are looking to explore digital simulation and to continue our collaboration with Siemens PLM Software. Owing to our success with virtual prototyping, we are ready to continue to improve our way of designing and expect we will achieve even greater results in terms of reducing time to market. With the results we've achieved and future plans in place, we expect to further differentiate our strong position in our market sector."

**Siemens Industry Software**

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