

Achieving excellence in shaving technology

SICMAT intends to achieve this important goal tank to its 75 years of experience in this field and b strengthening its cooperation relationship with customers and supplier.

Aiming at highest efficiency, improving existing machines, designing new machinery, reconsidering project management planning and boosting training: these are the most important goals that SICMAT set on occasion of its 75th year of operation.

They are not only a terminal point but above all a starting point to achieve excellent results.

Based in Pianezza, near Turin, Italy, the company is a specialist in shaving technology and at present a partner of the largest automotive industry worldwide.

There are only four CNC shaving machine manufacturers in the world: two in Europe and two in Japan.

From Pianezza come machines that arrive at the most important industrial marketplaces.

SICMAT is Also the main supplier of gear shaving machine to the largest automatic transmission manufacturer, i.e. General Motors.

With Ettore Miletto and Alberto Miletto, Managing Director and Technical Director respectively, we recalled the historical records that marked the growth and ascent of this family business which had a 2006 turnover of 10 million euro; SICMA expects to overcome this result in this 75th ear of operation, in order to achieve a turnover of 12 million euro.

From universal machine tools to high specialized shaving machines SICMAT is established in Turin in 1932 and at first produces universal machine tools for the mechanical field, such as radial drilling machines, shaping machines and hydraulic presses.

However, due to the presence in Piedmont of a thriving automotive industry, the company is soon induced to focusing on more specialized technologies.

"In those days the world of machine tool was quite restricted - says Ettore Miletto-. With the wartime events many firms partially reconverted their production to the requirements of the time. In post-war ears the mechanical sector had an increasingly high thrust and we followed this rise also".

In 1950 SICMAT begins to design and build gear shaving and chamfering machines.



Fig.N°1- A old Sicmat shaving machine, one of the first model

“A middle-small enterprise is not able to produce everything and the competitive pressure forced us to become specialist in one type of technology”.

As the Managing Director recalls, the gear shaving process was first developed in USA in the thirties by National Broach (shaving technology is a *close relative* of broaching), because the methods then used for gear finishing were too slow.

However importing this technology from an overseas country was too expensive; this is the reason why SICMAT started a local production.

In 1985 Sicmat develops the first prototype of CN shaving machine b using CNC technology on a conventional machine.

Some ears later Sicmat engineered and launched on the market the first CNC shaving machine, the RASO 400 CNC.

From this moment, many gear manufacturers consider the name “RASO” as a synonym for shaving machine.

In the nineties, Sicmat start to cooperate with National Broach (the inventor of shaving technology !); in the meantime, the Northern American company became ownership of the Japanes NACHI:

So Sicmat becomes supplier of National Broach-Nachi and thereby produces RASO machine series, which are sold in the United States under the trademark Red Ring-Shavemaster.

At the same time, the Turin based company becomes stronger and draws up an agreement with the leading Italian company Samputensili, based in Bologna. Samputensili will supply the shaving cutters that are used on the Sicmat machines and, if necessary, offer commercial support.

Production has been located for forty years in the Pianezza plant where the staff amounts to 60 employee, mainly devoted to engineering and assembling activities.



Fig.N°1- *A modern Shaving Machine Mod. Raso 200 CNC*

In the last years, production has raised nearl 40 machines/year and the production cycle has been speeded up.

“Our job is machine designing, engineering and building, while mechanical components are purchased outside and the are inspected/tested in our highly advanced measurement room. Numerical control and rack mounts electric cabinets are supplied by Siemens, which produces them upon our specific requirements.

In this way, through co-design with Siemens we take advantage of their competence and experience, and can us up-to-date performing components”.

Twenty ears ago our export accounted for about 50% of the turnover, today our export share has grown up to nearly 90%. Our main customers are from Europe, America and Asia.

“For assistance service abroad (especially in the most far-of countries) we rely on skilled local technicians. After factory testing, the machine is shipped and the local trained personnel, makes the machine operative and offers the after-sales service. In case of specific problems specialized personnel is sent directly from Italy.

Our customers belong for about 80% to the automotive sector, while the remaining 20% belong to the field of industrial vehicles, tractors, gear reduction units and gear pumps.”

Sicmat like to define itself as “specialist in shaving”, thanks to this strategic choice the company has been able to find its own niche market and to face up the competition of low cost machines from Far-Eastern Asian countries.

Ettore Miletto says: “ We have made high investments in shaving technology and created a wide range of products, but our main force is to analyze customer requirements, to share our know-how, to engineer the most technical and economical solutions”.

What about the competition of emerging countries?

“New machines are purchased mainly by big companies that sell them when the respective production line is dismantled; The middle-low areas of the market are covered by second hand machines. So, there is no need of low cost machine from China”.



Fig. N°3- Alberto and Ettore Miletto

The evolution

Sicmat creates its first CNC machine in 1985, but the machine has several limits, due to the application of CN technology to a previous conventional machine.

Three years later is created the newly designed machine, specially developed for numerical control.

In 1988 is launched the RASO line, whose first model 400 is intended for large size gears.

A few years later, a new smaller version was designed, the RASO 100, intended to cut shave smaller size gears.

The new compact design undergoes further developments with the model 150 and 200 shaving machine that are sturdier and able to cover a wider range of applications.

“The real “baptism of fire” for RASO 100 happened in the years 1995 – 1996 when this machine was first used to cut shave automatic transmission gears of General Motors, Strasbourg, France” Ettore Miletto recalls. *“Since then the machine has been continuously improved and has become our top product. Gears for automatic transmission are made worldwide in amount of about ten many millions. Furthermore the RASO 200 has been adapted to cut shave conventional transmission gears also.*

Due to a wide variety of options regarding loading system, layout and number of controlled axes, the RASO 200 is extremely versatile; it can be used with full satisfaction by a big manufacturer as well as a 20 employee enterprise”

During the last years a field of research where the company has been investing more and more is the integration of shaving machine with deburring and chamfering machines. By which protective operations are carried out on gear teeth. The combination eliminates the presence of multiple fixture in production line, with savings in terms of space and costs.

“Compacting the whole in one machine is a big benefit. We have been working to this solution for the last years and are still improving it.

Another important development is the introduction of a new deburring and chamfering process, using linear tools instead of rotational cutters. We have delivered a first machine to Renault: the main advantage is the availability of a simpler machine structure. This innovation has been patented”.

Another field of research and development has been axes synchronization in order to facilitate the meshing between workpiece and tool, reduce the risk of indexing errors and shorten cycle time.

This new shaving machine model will be exhibited at last EMO.

The last frontier for Sicmat is the machining after hardening, particularly the honing process.

Honing process has a lot of know-how in common with shaving process. Thanks to the similar approach for these two technologies, Sicmat could start to engineer application even in the honing process, although it is necessary to develop new performing mechanical units and to improve electronics.

With these 75 years at its back, Sicmat still wants to reach new relevant and important goals. The company points on *“the human factor”* and particularly on personnel training and quality organization.



Fig. N°4 – *Shaving machine RASO 2300 CNC with auto loading system*

(From Macchine Utensili – October 2007)