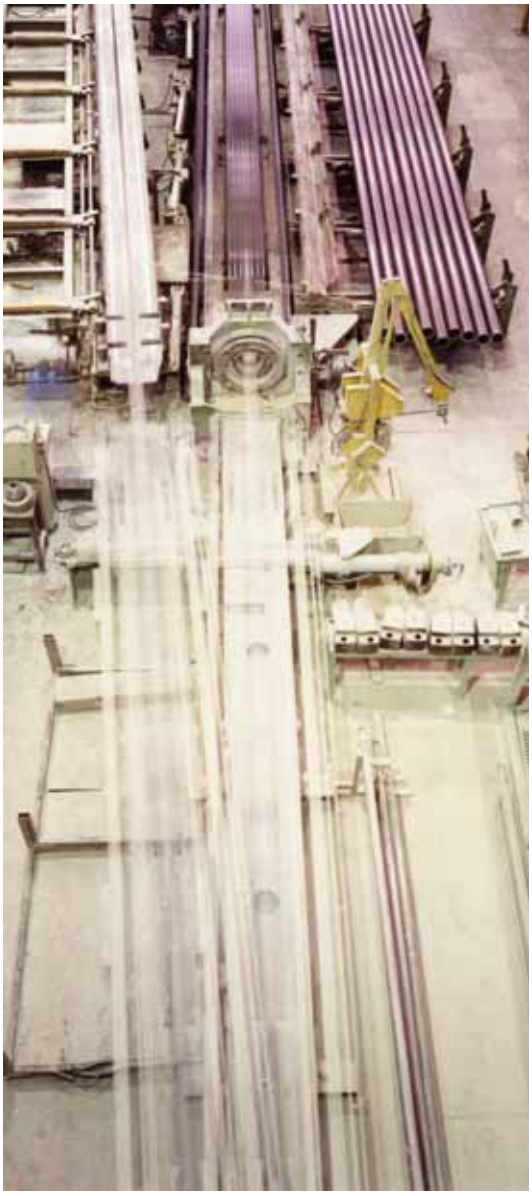
The Costa Volpino factory is one of the largest cold-drawing mills in Europe, with more than fifty years' traditions in developing and supplying mid and large diameter high performance products for the main industrial and earth moving machineries operators.
The Silcotub mill in Romania has been working for more than 30 years in the iron and steel industry, and since 2004 has been working with the Costa Volpino plant in supplying small diameter tubular components for the automotive industry. The two drawing factories also serve the precision mechanics and thermal industries (rifled tubes to improve heat exchange, alloyed steel pipes up to 24 meters length for use in high efficiency boilers). The cold drawn pipes are ideal for all those applications that require very limited size tolerances, excellent surface quality and high mechanical properties, especially in terms of high fatigue resistance.
Production in the Tenaris European mills comply with the highest quality and environmental standards in force (for more details about company certification, please visit the Tenaris site:
http://www.tenaris.com/en/QHSE/QualityCertifications).


Tenaris

# 10 reasons for choosing a unique industrial drawing system in Europe



**1** Totally integrated production process: direct management and control of all the production phases, from definition of the steel chemical properties, to the steel works, rolling mill and drawing through to the final production of the finished product. This allows to obtain a special product (even non-standard) that responds to the customer's needs, material tracking and, therefore, its constant quality control. The longitudinal continuous rolling technology that is used in the Tenaris European mills and the integration with the TenarisDalmine steelworks and TenarisSilcotub steelworks (in Romania), allows for a top quality semi finished which is ideal for the next drawing phase.

**2** Production flexibility and a wide dimensional range: each of the 3 finishing lines in the Costa Volpino factory is dedicated to a specific size range or to specific product lines, integrating with each other to achieve an external diameter of up to 280 mm (the 350 mm diameter is in the development phase). The coverage of a large part of the size range by different equipments is guarantee of production reliability.
The Silcotub mill has a finishing line covering from 12 to 120 mm for the production of airbags and other automotive applications, pipes for mechanical and power generation applications.

**3** Heat treatments: the 5 different types of furnaces in Costa Volpino along the drawing line provide an extensive range of heat treatments to both improve the customer's production process and the product mechanical properties in compliance with the design requirements (toughness, mechanical strength, ductility, etc.). They provide:

- Isothermal annealing
- Hardening and tempering
- Normalisation
- Stress relieving

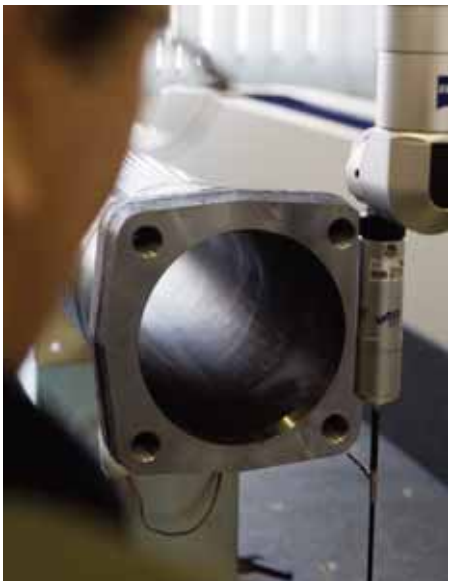
The Costa Volpino mill is equipped with heat treatment furnaces in controlled chemical atmosphere for products subject to fatigue in the car and machinery sectors, where it is fundamental to reduce the decarburisation processes (which can worsen the surface metallurgy properties).
The Romanian factory has a heat treatment furnace for:

- Normalisation
- Hardening
- Stress relieving

to guarantee the mechanical properties of the pipes subject to elevated pressure and temperature cycles.

**4** Dedicated laboratories and R&D teams: to respond to the needs for materials that maintain structural integrity even though they are subject to numerous machining cycles and even overloading in extreme weather conditions, Tenaris has developed steel grades with excellent strength and toughness which guarantee safety even at low temperatures.
In the Italian laboratories equipped for carrying out full-scale tests, Tenaris is able to calculate the reliability and life of the components for their qualification and has developed a calculation model that can estimate the spread of cracks in the various types of steel.
The design of the steel chemistry, the definition and control of the ad-hoc production process and the post-production tests for component qualification are all guarantees of quality and reliability.

**5** In-line automated controls: the Tenaris operative procedures prescribe that all the pipes are subject to non-destructive controls. The NDC identify possible surface discontinuity with electromagnetic controls, and internal discontinuity with ultrasound control systems. The ultrasound equipment that is installed on all the lines allows inspecting the thickness, eccentricity and identifying any longitudinal, transversal, oblique discontinuity and any lamination (the internal defects in the pipe that could compromise the material's fatigue resistance). The in-line controls mean that waste is considerably reduced. A downstream spectrograph control prevents any risk of mixing.

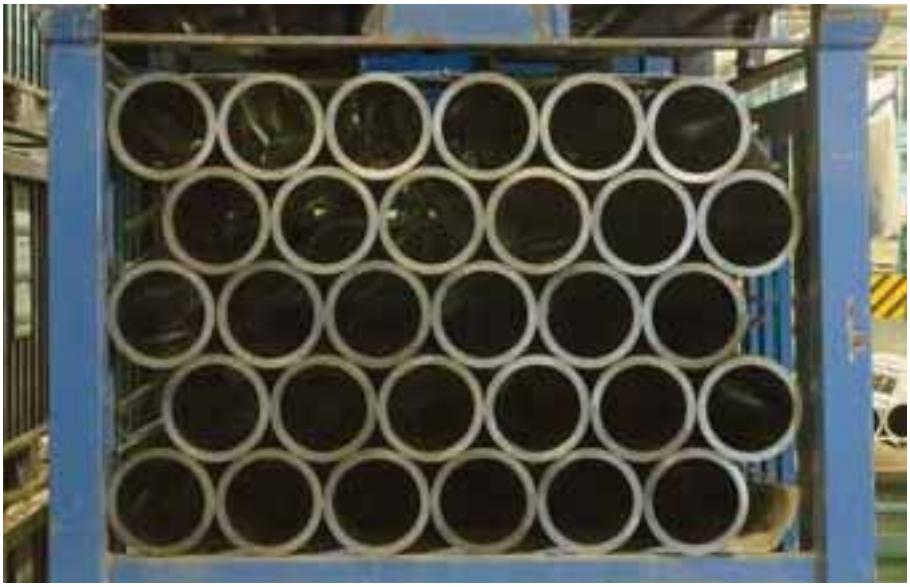



**6** Highly machineable steels specially developed for the hydraulic cylinder market: surveys that have been carried out among the main European operators have shown that using Tenaris cold drawn seamless pipes, thanks to the specific properties of the semi finished, to the strict dimensional and geometric tolerances and to the excellent surface quality allows to obtain:

- longer tool life;
- increased machining speed and, therefore, productivity (more than 30%-40% with respect to welded pipes).
- prevention of tool breakage (caused by discontinuity in the material with welded pipes).

**7** High production efficiency: elevated automation and production in terms of man/machine hours makes the 2 mills between the most efficient in Europe.

**8** Dedicated products and certified quality to ISO TS 16949 standard: The Costa Volpino and Silcotub mills are certified to standards regulating the production processes for the automotive sector. The definition and integral management of the production cycle, from the steel (with reduced inclusion levels) through to the final tubular component means that the materials can always be tracked and the time to develop the product and for the customer to qualify it (PPAP - Production Part Approval Process) are drastically reduced, critical factors in the automotive industry.



## 9 Vertical integration with the customer to optimize its supply chain.

*For the automotive sector*

To respond to the increasing need for cost reduction in the automotive industry, the Italian factories are integrated with the Zalau components centre in Romania where various operations are carried out, including forming and other mechanical processes to the customer's design for the production of the tubular parts.

*For the hydraulic cylinder sector*

- Thanks to the alliance with Stelmi, a leading European operator in the hydraulics sector, Tenaris can supply on request skived and roller burnished pipes with tolerances on the internal diameter H8.
- The Tenaris components centre in Zalau in Romania, which is equipped with cutting edge equipments for various operations including turning, welding of the flange and accessories, can produce the liner ready for assembling on the hydraulic cylinders.

  The Romanian factory also has its own laboratories to carry out the dimensional controls, checking the product is in line with the project design and carries out non-destructive tests that guarantee the conformity of the welding.

## 10 Promise performance, reduced lead times and personalized deliveries:

the average lead time for supplies to the customer over the last year has been over 95%. This excellent result is mainly due to the managerial improvements in terms of:

- 0ptimised planning and programming process.
- Periodic promise progress meetings.
- Periodic meetings to analyse any internal non-conformities.

Perfecting the quality parameters has led to reduced re-rolling processes and reduced positions lost due to waste. The non-conforming materials are rapidly dealt with, zeroing the problem solving times with real-time decisions being taken as whether to re-machine or re-roll the material.

Thanks to its line integration, Tenaris works just in time along the entire internal chain. From the moment the order is received it can be put into production in the Costa Volpino and Silcotub factories within two weeks at most with delivery within the next month.

To satisfy the hydraulic cylinder market the Romanian factory provides customised packaging (cages, pallets, wood cradle dividers), JIT deliveries, container shipments.