



Industrial & Automotive Services

Inside

2 Tamsa: Expanding Industrial & Automotive Market Presence in NAFTA, USA and Mexico

3 Automotive, Tenaris Focuses on the Recovery of the US Market

4 "Tailor Made" Steel for the Automotive Market

5 Dalmine and Caterpillar, an Ever Closer Partnership

6 Cutting Edge of Heat Treatments

Tenaris at the SAE 2002 World Congress

7 The Challenge of Integration

Tenaris Takes

8 EN: the Final Phase of the European Steel Norms Harmonization Process

TenarisNetwork Contacts

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Steel Sector, EN Coming Soon

This year the Old Continent will standardize the norms for steel tubes.

By the time of the European Community Coal and Steel constitution the first widespread standards had already been drafted, called 'Euronorm', which found, however, little application due to both technical shortcomings in relation to the objective difficulty of harmonizing them and to the fact that it wasn't obligatory to adopt them as a national standard.

The European Union's evolution has resulted in the present day European Standards Bodies, such as the CEN (European Committee for Standardization) and, in its own field, the ECIS (European Committee for Iron and Steel Standardization), for the iron and steel sector. To this we can add the changed contextual situation, which has brought about the present 'EN' as a result of long experience working with the national standards.

Finally, the regulations have also changed: in contrast to the old "Euronorm", the 'EN' has to be assimilated by all the EU countries and by EFTA (in total, the 20 member countries of the CEN) within six months from their approval, thereby replacing the equivalent national standards previously used.

Therefore, the EN norms are the definitive instrument at a community level to harmonize the market and break down technical barriers; they are the new and only contractual reference, and so have significant power at an industrial and commercial level.

Continued on page 8

▼ You will find the ESTA information brochure which illustrates the new key features of the normative picture for steel tubes with this issue.



Tamsa: Focusing on the Industrial and Automotive Sector

Excellent prospects on future growth in this market.



▲ Vincenzo Crapanzano, Tamsa's Managing Director.

Expanding industrial product market presence not only in the NAFTA countries, but also with an eye on growth in the Mexican system.

With this strategic orientation Tamsa, the Mexican production unit of the Tenaris Group, is organizing itself in order to increase production capacity, and to integrate its traditional work with products for the OCTG and Line Pipe sectors with those for the industrial and automotive market.

"Of late, thanks to the work we've done on improving the plant", explains Vincenzo Crapanzano, Tamsa's Managing Director, "Tamsa's production capacity has grown significantly: now it's about 800 thousand tons a year, of which 600 thousand is treated, or hardened and tempered.

Continued on page 2

Tamsa: Expanding Industrial & Automotive Market Presence in NAFTA, USA and Mexico

In order to reach this goal, sizeable investments in Tamsa's drawing mill will be made, to increase both production capacity and plant reliability.



▲ *By June of this year Tamsa's annual production capacity should be around 4-5 millions components for the automotive market.*

Continued from page 1

Only 20 percent of these products are sold on the local market; the remaining 80 percent is for export, mainly to Canada, Venezuela, central Africa and the Middle East.”

What is Tamsa's role in respect to B.U. Industrial and Automotive Services?

“In the Industrial and Automotive sector we foresee excellent prospects for future growth and we're concentrating on this a lot. Internally, for a year now, we've been managing separately the Industrial sector on one hand, and the Automotive on the other. This division is especially useful, in that it allows us to differentiate our services thereby making them even more specific.”

What moves is Tamsa making in the Industrial sector?

“At the moment, in the industrial area, we don't have a great deal of business within NAFTA, in the USA or the local market, but there is a lot of room for improvement. And it's on this that we are really focusing, because it would give Tamsa the opportunity to offset the cyclic nature of the Oil & Gas market. Our goal is to offer the market a mechanical standard product (which we are currently studying), suitable for use not only in the local market but also in the USA and NAFTA. Besides this, we are carrying out a thorough market analysis to quantify Mexican demand for industrial products (not only tubes, but also components): up to now, the figures emerged indicate about 30 thousand tons a year (standard and non-standard products, predominantly mechanical). A sizeable amount. The next step will be to implement commercial action aimed at potential customers and to assess the most appropriate strategy for the market.”

And what about the Automotive sector?

“As for the Automotive sector we're concentrating on NAFTA and Mexico. More and more often the tendency with the major American companies is to move production activity to Mexico, and this creates the need to find a local supplier. The Automotive sector will therefore be one more oriented to component manufacture, the larger part being obtained from cold drawn tubes. From here the need is to develop the plant. Last year we installed the first machines, and by June of this year we should have an annual production capacity of around 4-5 million components, above all for air bags (for Autolive, Arc). As of now the majority of this activity is addressed to the US market, but we already have definite plans for the near future, beginning from 2003, to manufacture components for the Mexican market.”

Which are the strategic objectives of the investment plan now underway for the development of Tamsa's drawing mill?

“The investment plan for Tamsa's drawing mill envisages various phases, with a series of actions aimed at increasing production capacity on one side, and on the other plant reliability. The final objective is to reach a production capacity of 50 thousand tons. The first part of the plan, currently in progress, anticipates a jump from 7 to 20 thousand tons; an increase connected almost exclusively to products for the automotive sector, which today accounts for 40% of the 7 thousand tons of drawn products. This means that once the investment plan is brought to completion, Tamsa will have a very efficient cold drawing system, giving very competitive costs, at the same level of the best European plants. We will also be helped in this by experts at Dalmine and Costa Volpino, whose experience we will be able to exploit.”

Automotive, Tenaris Focuses on the Recovery of the US Market

Tenaris' priorities are widening the range of services provided and developing their presence in a US industrial products market, which is now in a recovery phase after an initial stagnation.

"We think we are seeing the initial phase of an economic recovery", Ricardo Perugini, Sales Manager for Automotive Products, confirms from the Headquarters in Houston.

"The main OEM's have identified this and started planning for an increase in demand. Our customers' demand is also looking stable overall or has been increasing slightly throughout 2002.

However, we may still see some depression in the heavy truck segment, for which, if any, we expect a very hesitant recovery this year".

From an operations perspective, Tenaris has been able to consistently increase its participation in the market during the last 3 years.

"We went from 2,500 tons in 1998 to 6,000 tons

in 2001", says Perugini, "And we are looking at a 7,500 tons closing for 2002. Of course we are always looking for even more aggressive growth based on the current projects under analysis.

The success of this growth will depend on the overall industry activity and Tenaris' capacity to respond to a very demanding customer base, which we have an absolute confidence in."

What is the commercial strategy Tenaris is adopting for the automotive sector?

"Tenaris has been targeting segments in the North American automotive industry quite selectively. In contrast with a wide 'whatever tubular' approach, we've been looking for segments

in which we can maximize our strengths like added value, geographical proximity, technical skills (custom steel grades, heat treated materials) and global presence. This approach helps Tenaris keep a strong commercial position, thus assuring a long term relationship with our customers."

Which markets are you developing?

"Our focus has been on airbags, axles, suspension and transmission applications. We are currently working on airbag projects that will help us complete our goal of doubling our market share in this segment. We are also working on the resourcing of our axle products from AlgomaTubes which will provide us more of a domestic edge in the market. This maneuvers



▲ Ricardo Perugini, Sales Manager for Automotive Products.

together with our new additional focus on transmission will put us in competition on two market segments that combined add to more than 150,000 tons per year."

What is your relation to Tamsa and AlgomaTubes?

"Tamsa plays a key role in our strategy, not only for its current capabilities as a tube producer but also as our component manufacturing base for North America. AlgomaTubes is heavily involved in our developments for hot finished automotive applications. Unfortunately the complexity of such developments and the slowdown of the industry delayed the start of production of major projects during 2001. This year we are making good progress towards production dates and we are confident that we will have AlgomaTubes running automotive products for US customers as early as next quarter."



▲ Tamsa's components center represents a strategic component manufacturing base for North America.

"Tailor Made" Steel for the Automotive Market

The manufacture of steel tubes for particularly demanding applications in the industrial sector requires careful setting-up of the production process. One of the critical aspects is the processing of the steel.

Continuous research and innovation in processes, in the majority of cases carried out in close cooperation with the customer, are vital requisites to bring together the final characteristics of tubes destined for use in a market as sophisticated as the automotive sector.

"It's only when you know thoroughly the final application of your product," says **Andrea Poli**, senior engineer at Dalmine's Product Development department in Italy, "that it's possible to work out the optimum production process. Often the development of a product begins at a point that dates back to the steel processing stage, which must be paid particular attention to. In fact, it really is during the secondary metallurgic phase that the steel acquires the metallurgic requisites necessary for the subsequent stages of working, in order to guarantee a final product that has the right fatigue strength characteristics.

There's the case, for example," Poli explains, "of carbon steel types SAE 8617H and EN 25CrMo4, typically used in the niche sectors of the auto industry, to produce tubular components for transmission members. These products must guarantee elevated resistance to fatigue and abrasion in use, in addition to having metallurgic properties which will lead to a reduction in transformation cycle costs. These properties depend heavily on two factors: inclusion content and grain dimension.

The steel plant at Dalmine is committed to developing tailor made solutions to improve the properties of the above-mentioned materials, which are destined for both hot and/or cold forming and machine tool working.



▲ *Grain dimension analysis is one of the main factors that guarantees elevated resistance to fatigue and abrasion in use.*



▲ *Electric furnace control panels continuously monitor the steel processing.*

As regards inclusion content, a process has been set up which is able to produce steel with a very low content of non-metallic components ('ultra clean' steel grades with DS < 1). Furthermore, the special processing procedure developed allows control of the morphology in addition to the inclusion composition by means of the balance of the slag analysis and calcium treatment of the alumina.

Such a result has been guaranteed by a combination of plant solutions and manufacturing rules that furthermore means being able to maintain high production levels.

Another fundamental aspect is that of grain control, which is very important both for intermediate working, quenching and/or casehardening, and for the properties the final product will have. This characteristic means a reduction in the costs of processing, in which the kinetics are speeded up to such an extent that the properties of the material are harshly tested. To impede the phenomenon known as 'grain thickening' which could leave the final product with poor mechanical properties, it's necessary to intervene during the processing stage of the steel, modifying the composition with a balanced addition of nitrogen and aluminium. The presence of flaky aluminium nitrides in the solid metallic matrix, in fact, is the necessary requisite to stabilise the metallurgic structure of the steel during phases of high temperature heat treatment. It's this outstanding quality that guarantees against the phenomenon of thickening."

It's a very delicate process, which Dalmine has set-up after a long phase of study and experimentation, that today is opening up new possibilities to the automotive and special mechanical applications sectors.

Dalmine and Caterpillar, an Ever Closer Partnership

For the manufacture of hydraulic cylinders fitted to earthmoving machineries, Caterpillar uses seamless tubes supplied by Dalmine. A critical component that, as Ernesto Del Col, senior buyer for Caterpillar Belgium, underlines, must guarantee security and reliability.

Caterpillar is a world leader in constructing earthmoving machineries: founded 76 years ago, with its headquarters in Peoria, Illinois, USA, it employs 65 thousand people around the world and has an annual sales volume equal to 25 billion dollars. The company has a network that covers the whole world: the central European office is located in Geneva, while production sites can be found in Belgium, France, Germany, Italy and England. The principal plant outside of the USA is in Gosselies, Belgium, where 4 thousand people work. Here they produce wheel loaders, excavators, diesel engines, and hydraulic components such as cylinders, directional control valves and transmission axles.

Just-in-time deliveries

Since 1994 Dalmine has been supplying Caterpillar with tubes to be used in manufacturing hydraulic cylinders fitted to excavators.

Initially supply was managed directly from the Costa Volpino plant, which had defined, in close cooperation with the customer, the product specifications.

“In 1995,” explains Luigi Pugni, European Sales Manager at Dalmine, “when service became a crucial factor in the relationship with Caterpillar, it was decided to entrust tube consignment to one of the former distribution companies of Dalmine (Tubi di Qualità - TdQ).

Caterpillar, in fact, required a specific production program

be respected and materials delivered the day requested, with the possibility of bringing forward delivery by up to a maximum of 5 days. Furthermore, there was the necessity to supply tubes cut to various lengths, according to the type of cylinder and machine to which it would be fitted. Dalmine, through one of its former distribution companies, was in a position to meet these requests: actually, we had ample warehousing and cutting capacity and were able to guarantee a promise level (a performance indicator) which varied between 98 and 100%.”

From 300 tons supplied in '96, consignments to the Belgium plant grew to 800 tons shipped

by Dalmine in 2001, maintaining a very high promise level.

New working enriches the service

As 44 year old Ernesto Del Col, Senior Buyer at Caterpillar's Belgium branch, underlines, deliveries being on time and the security of the product's quality are crucial elements: “Our relationship with Dalmine is very good. We work in complete confidence, which is mutual and couldn't be otherwise, as Dalmine supplies tubes for the most critical components of our machines, where all their power is brought to bear.”

Pugni concludes: “Caterpillar has always



▲ Ernesto Del Col, Senior Buyer at Caterpillar's Belgium branch.

ordered 'designed' pieces. Now we are evaluating the possibility to furnish, besides cutting and personalized packaging (7 pieces on a pallet), additional working, such as turning, which can streamline the customer's working cycle. With the prospect of increasing our participation quota, which today stands at 35-40 percent.”



▲ Dalmine provides Caterpillar personalized packaging for their cylinders: 7 pieces on a pallet.

Cutting Edge of Heat Treatments

The heat treatment strongly influences the properties and quality of the final product. The most recently developed systems using protected active atmospheres offer clear advantages.

Research trends in recent years have been aimed at perfecting active atmospheres in order to guarantee maximum protection of the tube during heat treatments.

It's in this direction that, both studies for the plants of the entire Tenaris production system and various other projects- that for next June will bring to fruition a heat-treatment furnace for hot rolled small diameter tubes- have been developed at Dalmine and Costa Volpino plants.

The latter will bring to fruition a heat-treatment furnace forecast for June of this year for Dalmine's Small Diameter Tubes Factory.

"The primary advantage that an active atmosphere gives in heat treatments," **Serafino Cretti**, Cold Drawn Tube Product Development Technical Manager at Dalmine, states, "is oxidation inhibition, which allows what has come to

be called a 'white' treatment to be obtained, where the material leaving the furnace is of a light grey colour.

A second quality is the appreciable reduction in decarburization processes, cause of carbon impoverishment on the product surfaces and consequent worsening of the surface's metallurgical properties and mechanical characteristics, above all for products subject to fatigue.

These effects, in fact, become critical most of all in the case of alloy steel tubes or products destined for especially heavy applications such as stabilizers and front-wheel drive shafts for cars."

Research underway

The automotive market demands products free of any decarburization, and this necessitates setting up heat treatments of an ever-higher standard. Furthermore, the problem of possible

decarburization is monitored not only at the heat treatment phase, which brings into play active atmospheres able to avoid impoverishing the carbon content of the steel, but also during the hot rolling stages.

"An in-depth study about what we know of the changes in rolling stages is presently being conducted in cooperation with the materials research centre at the Dalmine plants, in particular at its Small Diameter Tubes Factory.

The results of this study will allow us to set up with greater precision the working parameters of the reheating phases of the rolling cycle and of the heat treatments the different products will successively undergo.

The latest generation heat treatment plants guarantee the most satisfying results. They use active atmosphere generators produced with



▲ One of the heat-treatment furnaces with an active atmosphere in operation at the Costa Volpino plant.

a catalyst that, causing natural gas and oxygen to react, creates a gas composed of CO and hydrogen of high purity without causing any actual combustion and so without producing water and carbon dioxide, elements that could provoke oxidation and decarburization of the tubes."

This atmosphere is then diluted with pure nitrogen to be introduced into the furnace to guarantee surfaces free of oxidation and decarburization.

Tenaris at the SAE 2002 World Congress

In Detroit, Michigan, from March the 4th to 7th Tenaris took part in the SAE World Congress, the largest OE service, parts and components exhibition in the world.

Each year this trade show gathers together about 50,000 automotive executives, OEMs, other industry professionals and more than 1,000 suppliers and manufacturers from all over the world.

Tenaris was there for the 3rd consecutive year and presented its new brand to the automotive world as well as its wide range of value added products and manufacturing capabilities to prospective customers and business partners. Engineers from Honda's R&D group, DaimlerChrysler, ArvinMeritor and NSK Corporation were just some of the visitors at the Tenaris pavilion.

Kyle Lednicky and Scott Stephens, Automotive Account Executives for the Industrial and Automotive Services group based in Houston, were there both to pick up on trends and to illustrate Tenaris' manufacturing and services capabilities.

"This year," says **Ricardo Perugini**, Sales Manager for Automotive products, "due to the economic downturn in the US economy, we noticed that manufacturing suppliers showed less interest in this exhibition, whereas services firms and high technology products companies participated consistently."



▲ Some of the Tenaris' automotive products at the stand were: air bag inflators, constant velocity joint cages, gear box synchronizers, steering system arms, impact side beams, bushings and bearings.

The Challenge of Integration

Tenaris' concerted effort is related to providing the highest quality of integrated logistics services. The web plays a key role in this strategy.

Luca Celora is responsible for Dalmine's Supply Chain and Logistics. Large shipments from Dalmine plants, which go directly to Tenaris' big customers, all depend on him.

"We're doing a lot as far as shipping large batches goes," says Celora. "The fundamental objective we've had all along is to integrate as much as possible the entire logistics system. We've started to 'attack' the two outermost links: that of planning production and utilizing stock, and that of transport.

One of the first cases where integration has produced interesting results is in shipments between Italy and the USA: having to improve delivery performance and at the same time safeguarding costs, we've shook up both production planning guidelines and sea transport 'negotiation' in order to have a more rigid and efficient calendar. At an international level, Dalmine is trying out new solutions that include using various types of transport and large logistics agents, so as to satisfy not just transport needs, but also additional services, giving the customer a significantly higher quality of logistics service. In reality, being able to offer additional services that have by now become an integral part of what was once simply transport and delivery of the goods: in a nutshell, being able to see the various aspects of an order at any time, such as production progress, information, and related documentation, packaging, transport accessories, etc.

This is the final goal we are working towards and it's where, obviously, the WEB is becoming the natural place to 'meet' our customers."

The other fundamental point is planning. "Here the goal," concludes Celora, "is to achieve the best mix possible between the plant's production capacity and the finished and semi-finished product stock.

We're on the right tracks for improving plant flexibility, further reducing plant answer times.



▲ Boiler tubes being loaded onto a ship in the port of Anversa last July on their way to Korea.

One result, gained thanks to the real effort made in information systems development, is establishing a single platform which integrates the whole production process in the entire Tenaris network, from the quotation and customer order right down to delivery of the product to its destination."

Tenaris Takes

US Trade Restrictions on Steel Products: the Seamless Tube Sector Hasn't Been Affected

Measures inside the safeguard action (Section 201 of the 1974 US Trade Law) took effect starting from 20th of March 2001 for a period of 3 years.

According to the steel 201 resolution, non OCTG welded tubes has been affected, whereas both OCTG welded and seamless pipes and seamless tubes employed in Tenaris' automotive production as well as in other fields such as the industrial and mechanical have all been exempted, given that injury to the US manufacturers has not been proved. The Section 201 applies to a wide number of steel product categories, 48 of which have already been excluded and requests for a further 200 have already been made; an exemption has also been made for NAFTA and developing countries.

Giovanni Antonietti, Dalmine's Marketing Manager, states: "The greatest fear is related to the risk that products shipped from third countries outside Europe and USA will be diverted from the US to the European market, but the European Commission announced that a similar measure will be adopted in the month of April".

Tamsa Wins New Contract to Supply Krupp Hoesch with Stabilizer Bar Tubes

Following a long approval process Tenaris wins contract with Krupp Hoesch to supply 18 mm x 3 mm 28Mn6 tubes for Volkswagen's New Beetle and Jetta stabilizer bars.

In May 1999 Tenaris and Krupp Hoesch began to look at the possibility of using Tamsa tubes for Volkswagen's A4 platform stabilizer bars. Various tests were performed to produce the steel and samples were presented to Hoesch in November 2000. Tenaris then awaited the results of the Hoesch/Volkswagen AG testing program and in January this year, the first purchase order was finally placed. Krupp Hoesch required a steel with a low level of non metallic inclusions and stringent levels of decarburation. Volkswagen has a large manufacturing facility, employing over 12,000 people in Puebla, approximately 350 km from Tamsa in Veracruz, where they manufacture the Jetta, Sedan, Cabrio and Beetle models.

EN: the Final Phase of the European Steel Norms Harmonization Process

The new EN represent a step ahead in terms of clarifying product definitions and transparency in applying them.

Continued from page 1

“Today,” Cataldo Cappelli, Corporate Standardization Manager at Tenaris, explains: “we’re in the final phase of this process of European harmonization, and in 2002 in the steel tube sector we’re going to see the majority of the old national standards repealed (in Italy the UNI) and being replaced by the EN European norms (still edited in Italy by UNI, with the abbreviation UNI EN).”

The EN feature that has the most immediate bearing is how the steel is designated, which is twofold: numeric and alphanumeric, such as the ISO (International Organization for Standardization) and a code related to the identification and application of the product.

In addition to the technical aspects and the advantages derived from a reduction in the number of standards, there are significant developments in the new European standards picture in terms of clarifying product definitions and transparency in applying them.

The product is already conceived at the planning stage on the basis of performance criteria. It is then launched onto the market, identified and certified for appropriate use in a given field of application. Product upgrading is not envisaged (change of the sector of application). This precise regulation guards against improper product use and allows easier tracing of any possible responsibility in cases where someone works outside the regulations.

“It’s clear,” comments Cappelli, “that using a product for an application different to that expected by the EN reference, such as using an obsolete product (for example related to the old national standards repealed by the emission of the corresponding EN norms), means assuming complete responsibility, civil and criminal, in cases of formal notice, accidents or damage due to a defective product.

The need to refer correctly to the European standards is even more evident where there are European Directives.

In actual fact it’s important to remember that, even if remaining in a voluntary context, the ‘harmonized EN’, so called because they are prepared by a Commission mandate and are linked to a specific Directive, are viewed as a primary reference and are presumed to satisfy the essential requirements of this Directive.”

As already mentioned, the greater part of these standards, some are already available, will be issued within this year.

From here there is a necessity for an information campaign sponsored by the CEN to encourage implementation of the EN in each country.

To face this need the ESTA (European Steel Tube Association) drafted an information brochure that can be found with this issue.

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