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FOMAS Group - Project 2012: A year ahead of schedule!

FOMAS Group, a world leader in open-die forgings and seamless rolled rings, has invested over 250 million euros in new facilities, machinery and technology around the world. Moreover, these investments were made during a time when most companies were cutting back. Prior to the financial crises, the leaders at FOMAS had the foresight to invest in the company's future. In 2007, the "Fomas 2012" project was launched to significantly increase the group's manufacturing capabilities and capacity. When the world's financial crisis hit and was taking its toll on most businesses, the company continued to move forward with investments as planned. Impressively, this major investment project is more than a year ahead of schedule! The new facilities, many of which are already operating, will be complete and fully operational in 2011. CFN had the pleasure of visiting the new facilities in Italy to speak with Mr Jacopo Guzzoni, Vice President and Group CEO, Mr Carlo Rocca, Rings & Open Die Forgings Divisions Director, and Mr Nicola Boletta, the Group's Business Development Director, to learn more about the investments and vision set forth for the Group.

by Betty Hammond

110 MN Open Die Press with 400 Tmt integrated manipulator

FOMAS Group produces large and small open die forgings and seamless rolled rings in any type of steel and non-ferrous alloy, destined mainly for power generation, oil & gas, aerospace, industrial bearings and transmissions sectors. Headquartered in Italy, the family-owned and operated business has manufacturing facilities in China, France, India and Italy - with an additional sales office in the USA. Manufacturing facilities in India (BayForge Ltd) focuses on open die forgings, but also manufacture seamless rolled rings, many of which are used in civil applications in the aerospace sector. Manufacturing facilities in France (La Foulerie) and China (FOMAS Dalian) forge components mainly for the automotive and bearings industries. CFN visited the company's headquarters and main facility for open die forgings in Europe (FOMAS SpA) and its European large ring rolling division (ASFO SpA), both of which are located in Northern Italy.

"Historically, the company has had strong growth in turnover for all our products. From the smallest ring all the way up to our largest products," says Jacopo Guzzoni, VP and CEO for the Group, as he shared a bit of history and developments involved in these recent investments. "It was decided, even in the most depressed period, to move forward with our planned investments in order to grow the company. We continued to be optimistic even in the darkest period." He continues, "In order to grow our market share, our plans included growing the capacity of the weight and size of the product we are able to manufacturer. Much of this developed from our customer demands and requirements. In the past, as an example, we were providing mainly the gas turbine products requested by our customer while also supplying some steam turbine products. Overtime, the same clients were requesting that we provide as many of their gas turbine needs as before, and an important share of all their steam turbine products, too. Similarly for nuclear power station components, where FOMAS has been active for over 40 years, the new investment will allow our customers to rely on us for very large forgings required in nuclear reactor vessels and in steam generators. So, from the smallest ring, to medium, and up to giant forgings, we needed to provide the full range of products while maintaining our level of high quality."

Jacopo Guzzoni, VP & Group CEO

"However, when speaking of quality, I want to stress that we are not talking about compliance – simply meeting set standards – here, we are talking about the ability to understand customers' requirements, to be able to help the customer solve their problem and to help the customer understand their overall total costs," expresses the CEO. "The major difference in this approach," interjects Nicola Boletta, FOMAS-Group Business Development Director, "is that often the customer doesn't know or realize there may be other solutions for their particular situation. Perhaps there is a different material with improved properties that could be used. They are focused on just meeting the standard, or perhaps are only looking at price. At first, they may not like when we advise them on a new or different method, but later they do appreciate it." This strategy may mean that FOMAS will not always offer the lowest price, but it has moved the company from the realm of simple supplier to a position of valuable business partner.

As more and more clients request co-operation and advice, they are also demanding increased flexibility and on-time delivery. "It is part of FOMAS' commitment and strategy to understand the customer and to meet these demands," says Mr Guzzoni. An example shared with us is that while working to expand business in Russia, they heard over and over again that the Russians found many suppliers to be "inflexible" – unable to change from their routine or normal operating procedure. FOMAS listened and convinced the Russian clients to try a few orders. The flexibility FOMAS offers and their ability to meet delivery times has kept the Russian clients coming back.

"Much of this ability to be flexible and to meet delivery times has to do with our manufacturing method," says Mr Boletta. "In this line, the layout of the new facilities allow for maximum efficiencies." FOMAS' own engineering department is attributed with the design of the manufacturing cycle. Pulling from their metallurgical and technical knowledge, developed in their years of experience in manufacturing forgings for critical applications, the engineering team has designed an efficient and accurate production cycle. At ASFO, the rolled ring division centre in Italy, we experienced this full and efficient manufacturing process first hand. From heating furnaces to forging press, from press to ring rolling, from heat treatment to, in this case, polymer quenching to final machining – we could see the new efficient procedures set in motion. The facility is designed so that a continuous flow of product can be processed with little to no interruption between pieces.

One thing that stood out as exceptional to me during our tour is the expertise combined with the relative youth of the FOMAS teams that greeted us at every step of our tour. From the plant managers to the in-house testing team, each and every person we met seemed to be relatively young compared to the experienced levels of expertise they offered! "Investments were not only made in our equipment, but also in our people," says Mr Guzzoni. On the job training is a key part of the company's success. Hiring the right people early in the game, and offering them a work environment that promotes learning and personal growth opportunities is a key part of the overall company success.

110 MN Open Die Press with 400 Tmt integrated manipulator

Facts & Figures

Name:	FOMAS Group
Products:	Large and small open die forgings and seamless rolled rings
Materials:	any type of steel and non-ferrous alloys
Industries:	Power Generation (nuclear, conventional and Oil & Gas Aerospace, Industrial Bearings and Transmissions
Locations:	China, France, India, Italy and the USA
Websites:	www.fomasgroup.com

Fomas SpA Manufacturing Capability

- 3 Forging Presses: 3.500T - 6.000T – 11.000T
- 3 Rail Integrated Manipulators: 80Tmt – 250Tmt – 400Tmt
- 3 ESR facilities up to Ø2000
- 16 Heating Forging Furnaces
- 29 Heat Treatment Furnaces
- 2 Oil Quenching Tanks
- 3 Water Quenching Tanks
- 1 Horizontal Spray Quenching Facility
- 3 Heat Stability Test Machines (up to 70 tons rotor)
- 14 CNC Horizontal lathes
- 9 CNC Vertical lathes
- 2 CNC Milling-Drilling Machines
- 3 CNC Universal machining Centres

Max. Dia.: 5.500mm
Max Length: 18.000mm
Max ingot: 120 Tons ESR (equivalent to 170 Tons conventional ingot)
Max. Shipped Weight: 100 Tons

FOMAS SpA

FOMAS Group has invested over 100 million euros in new equipment and upgrades at FOMAS SpA in Osnago, Italy. FOMAS SpA is global supplier of top quality open die forgings demanding high structural integrity. FOMAS forgings are often the most load bearing components in a plant, operating under high temperatures and pressure. This investment in FOMAS' future maintains their driving edge.

Twin drilling head turning lathe

110 MN Open Die Press

A highlight of the recent investments, and one that is hard to miss, is the 110 MN open-die forging press supplied by Danieli Breda. The press is described as a push-down design with four pre-stressed columns, for which Danieli will also supply the oil hydraulic, electrical and automation systems. The impressive mechanical structure stands 13.5 metres high at a depth of 6.5 meters, with a vertical daylight of 5.5 metres and horizontal daylight of 5 metres. Its structural design guarantees an eccentric load at full force of 700 mm with a maximum frequency of 15 strokes per minute, according to Danieli. In operation, the new press will be able to process up to 165 ton ingots. In addition to providing turnkey installation and commissioning of the press, Danieli is also responsible for the integration of the 400 Ton mt rail manipulator.

ESR Facilities

Three INTECO Electro Slag Remelting (ESR) furnaces with computer controlled process automation have also been installed. ESR is recognized as the preferred production method for high-performance alloys and superalloys typically used in industries such as power generation and nuclear engineering as well as for heavy forgings. FOMAS' ESRs can manage up to 120-Tons ESR ingots, which is equivalent to a 170-Tons conventional ingot.

Heat Treatment

The latest investments include 29 state-of-the-art fiber lining heat treatment furnaces with a capacity of 500 tons single batch and size up to 5.5 mt. This facility also includes three water-quenches measuring up to 18 mt in length and 6 mt width. Plus, two oil-quenches and a horizontal spray-quench are available. FOMAS heat treatment cycles are always monitored with contact thermocouples attached on the forgings (in addition to the furnaces' thermocouples), monitoring the outstanding temperature uniformity of the full batch.

Heat Stability Test Machine

When forging large pieces such as a turbine shaft or rotor axis for a steam engine, several forging steps are necessary, it is important that the longitudinal axis of the original forging ingot is maintained as the axis of the rotor forging. Heat stability testing furnaces are large enough to contain all the parts that need to be tested and allow the forgings to rotate while being heated to a required temperature. The two new Heat Stability Test Machines at FOMAS are flexible and can test from 500kg up to 80 tons rotors. FOMAS Group is also operating two Heat Stability Test Machines in India at Bay-Forge plant for rotors up to 25 tons.

Non-Destructive Testing

FOMAS offers state-of-the-art non-destructive testing. All stages of testing are supervised by NDE III personnel. During manufacturing each forging undergoes several in-process internal inspections. Statistical evaluation of all the UT results is made to monitor the raw material suppliers' performance and process stability. The Ultra Sonic system at FOMAS, called UltrasonicFOMAS (UFO), is qualified an approved by GE, Siemens and Alstom. FOMAS is equipped with 6 vertical stations and 2 horizontal stations to automatically inspect almost every type of forging. Automatic ultrasonic inspection can be performed in accordance with any customer UT specification and or international standard.

Destructive Testing

FOMAS is equipped with a fully automatic lab for tensile and impact test. Served by a robot, the system performs tests in a fully reliable and repeatable way. Hot and cold tensile test, creep test, drop weight test machines complete the lab. Chemical composition and metallographic lab is fully equipped to perform any type of evaluation that may be required by specifications or R&D department.

Machining

Final machining at FOMAS covers more than 28 machining units. The new investments include 14 CNC horizontal lathes, 9 vertical lathes, 2 Milling-Drilling Machines and 3 Universal Machining Centres.

Automatic destructive test

New water quenching tank at FOMAS

ASFO SpA

ASFO is the European large ring rolling division for the FOMAS Group. For over 40 years ASFO, located in Chiuppano, Vicenza, Italy, has supplied rolled rings and profiled rings on small- medium- and large-scales for a wide variety of industries while always maintaining a very high quality standard. Technical know-how and state-of-the-art machinery and equipment make it possible for ASFO to produce various profiles and shapes on rings which are symmetrical for rotation. A large portion of FOMAS Group overall investment plan went into new facilities and equipment at ASFO. Over 80 million have been invested at this location. Some highlights of the investment:

Cutting Mill

In addition to the normal bend-type cutting machine, this facility is equipped with an ultra-high speed cutting machine capable of maximum 800 mm diameter billet that require very few minutes to complete each cutting. Impressively fast and efficient, since the first step of the production route we got a clear idea about this designed-for-productivity facility.

Presses & Rolling Mill / Heating furnaces

We saw the new manufacturing line in operation. The 5000 ton press served by two semi-automatic 15 ton manipulators on rails. The hot material was moved from one of the three heating furnaces to the press. The press, equipped with centering arms and swinging tools for punching and piercing to grant the perfectly axial position, was at this time being used to punch. The second manipulator then took the preformed material to the ring mill, after a proper re-heating, for automatic radial-axial rolling to required dimension. Fast, flexible and precise, the new line grants high productivity and low material allowance. The high power of the new ring mill will boost ASFO efficiency for their specialty: contour rolling. With the new line ASFO has grown its capability to 7 mt in diameter and 15 tons in weight.

Heat Treatment

The new ASFO facility is also equipped with modern and state of the art heat treatment department. 14 heat treatment furnaces and 2 quenching tanks (water and polymer) assisted by a completely automatic loading/unloading device with a 30 tons capacity. Rational layout and high productivity are the best levels to be seen in such a modern facility. Furnaces are governed by a centralized and computerized control room from which, at a glance, all the parameters and the department equipment are under full control.

Machining

19 new machining units can be found at the ASFO Machining Centre. During our visit, most, if not all, units were busy and fully operational. ASFO is equipped with turning lathes, some of those featured with twin drilling head, as well as milling-drilling machining centres. A further step towards meeting customer needs is the ability of this new plant to deliver completely finished components. Very tight tolerances and geometric requirements can be realized. Ready-to-install components are today an important portion of ASFO's output.

Innovative Manufacturing

Most impressive at the facilities we visited are the innovative manufacturing layouts. The flow of goods pulls heavy traffic away from populated areas and keeps the manufacturing flow at peak efficiency. Neat, clean, accurate, efficient! Not to forget, completed in record time - a full year ahead of schedule!

Ring rolling operation

The official inauguration of the new FOMAS facility is set for 14 May 2011. ASFO's official opening of its new facilities is set for late September 2011.

ASFO SpA Manufacturing Capability

- 13 Band saw cutting machines (Max. Dia.: 1.200mm)
- 1 Automatic high-speed cutting machine (Max. Dia.: 800mm)
- 3 Hydraulic Forging Presses: 1.800T - 4.500T – 5000T
- 3 Radial/Axial Rolling Mills: 150/100 – 315/200 – 400/400
- 5 Manipulators: max 15Tmt
- 15 Heating Forging Furnaces
- 14 Heat Treatment Furnaces
- 5 Quenching Tanks: Oil and Polymer
- 20 CNC Vertical lathes
- 1 CNC Universal machining Centres

Max. Ring Dia.: 7000mm
Max Ring Height: 1200mm
Max Ring Weight: 15 Tons
Max. Ingot Weight: 40 Tons