Allegheny Technologies the metals renaissance

With nearly 40 years of experience in the metals industry Mr. L. Patrick Hassey, CEO at Allegheny Technologies Incorporated (ATI) in Pittsburgh, USA knows and loves this business like few others. As today's metals industry enters a period of renaissance similar to, and yet far larger than, the boom years of the late 1950's-to-early-1970's, Mr. Hassey is passionate about ATI's vast range of specialty metals and the outstanding innovations ATI provides for its customers around the globe. He took some time out from his busy schedule to share with us his vision of the metals industry … and his infectious enthusiasm for it.

By Joanne McIntyre and John Butterfield

Mr. Hassey entered the aluminium business in 1967 at a time when metals were on a surge in the world economy. "I joined Alcoa at a time when metal businesses were booming" Mr. Hassey reminisces. "This cycle ended in the mid-1970's so for most of my career I was working in an industry in transition – one trying to find its place in the global markets again. I retired from Alcoa in 2003 after 35 years and joined Allegheny Technologies (ATI) six months later. Shortly after joining ATI, I noticed that I was rejoining a climate in the metals marketplace very similar to the one in which I had started out in 1967. I saw the same drive, motivation, growth, and opportunities."

The excitement generated by the rebuilding of large parts of the world's infrastructure after World War II and the Korean War was what first motivated Mr. Hassey to join the metals industry. "I see many similarities and parallels today with that earlier time period in the tremendous demand for infrastructure growth in China, Asia, India, and Brazil. In this respect my knowledge and experience in the metals industry is quite unique, spanning so many years. Today we're seeing the emergence of people in the developing countries wanting to move into a middle-class economic status. They are driving this economic growth. These groups include, at current estimates, approximately 300 million people in China and over 300 million people in India. A similar situation exists in the Middle East. This

Titanium finishing at ATI's Rome Metals precision processing facility

embraces

economic surge is four to five times larger than that which took place from 1955 to the early 1970's. This surge has led to a renaissance for specialty metals. Of particular significance are titanium and titanium alloys, nickel-based alloys and superalloys, stainless alloys, zirconium and zirconium alloys, and tungsten metals– all of which are products in which ATI excels."

Global markets

ATI's largest market, which accounted for 31% of total revenue during the first half 2006, is aerospace and defence, which consumes huge amounts of specialty metals, especially titanium, for building jet engines and airframes. "The aerospace and defence market is robust. New airframe designs use greater titanium alloy content than in past models. New efficient engines use higher grades of our titanium alloys and nickel-based superalloys. Our second largest market is chemical process industry/oil and gas, which accounted for 17% of ATI's revenue. The driving force for growth in the oil and gas market is the need for energy, particularly from difficult environments and alternatives to traditional energy sources," explains Mr. Hassey.

Mr. L. Patrick Hassey

As the world's resources become rarer, they are being extracted from harsher and deeper environments which have in turn led to an increase in the need for specialty metals. "For example, the United States Congress is considering allowing American companies to drill in the outer shelf off US shores. They're talking about drilling 50 to 200 miles offshore, into deep and corrosive environments which require equipment made from specialty metals able to perform and hold up under these conditions. An example of a non-traditional energy source is heavy oil where heat is often used to extract oil from deep below the surface. As a result, our titanium and superstainless alloys are needed for this very corrosive environment.

"As fuel prices have risen dramatically in the US, there is also a new incentive to derive fuel from ethanol. These projects require fermenting and storage tanks, tubes, and piping structures. All are made from stainless steel alloys and corrosion resistant products. So this is becoming a major market for us as well."

ATI's next largest market is electrical energy, which generates 11% of its sales. "We have a product called grain-orientated silicon electrical steel which is used in power transformers on telephone poles and in large sub-stations" explains Mr. Hassey. "This market has expanded tremendously in the last year. We now provide grain-oriented silicon electrical steels to India and China, and have used the same type of products for rebuilding the southeastern part of the US after the last year's hurricanes. ATI is also heavily involved in power generation. Legislation has powered demand for flue gas desulfuization scrubbers, which are made from our stainless and specialty alloys."

Titanium cast impellors

Allegheny Technologies' specialty alloys are also used to take advantage of the rapid advancements taking place in the medical industry, such as knee and hip replacements, stents to widen arteries, and MRI machines. This market generates around 4% of ATI's total sales. "Few people know that the markets in which we work are so diverse," says Mr. Hassey. "I think that to excel in so many fields is quite unparalleled, particularly

when we compare ourselves to other companies in the business. We believe that in the near future, these four markets (aerospace and defence, chemical processing/oil and gas, electrical energy, and medical) will generate approximately 70% of our revenue," he goes on to enthuse. "Opportunities have never been so good in such a broad basis of industries in which ATI plays a leading role."

Investment and innovation

The renaissance of the metals industry is giving Allegheny Technologies the freedom to invest in inventing new metals and offering alternatives to help customers best meet their specialty metals needs. "We've developed AL 2003™ lean duplex alloy to substitute for Type 316L in chemical process industry, oil and gas, power generation, service water, architecture, mining, fertilizer production, pulp and paper, and ship building applications. Our AL 20-25Nb alloy is an alternative to nickel-based alloys for high temperature applications in process industries and power generation. Our patented tungsten composite tooling is a brand new idea that allows tooling to run faster, deeper and cooler so we get more speed out of the drill bits. We are specialists in providing alloys for harsh environments."

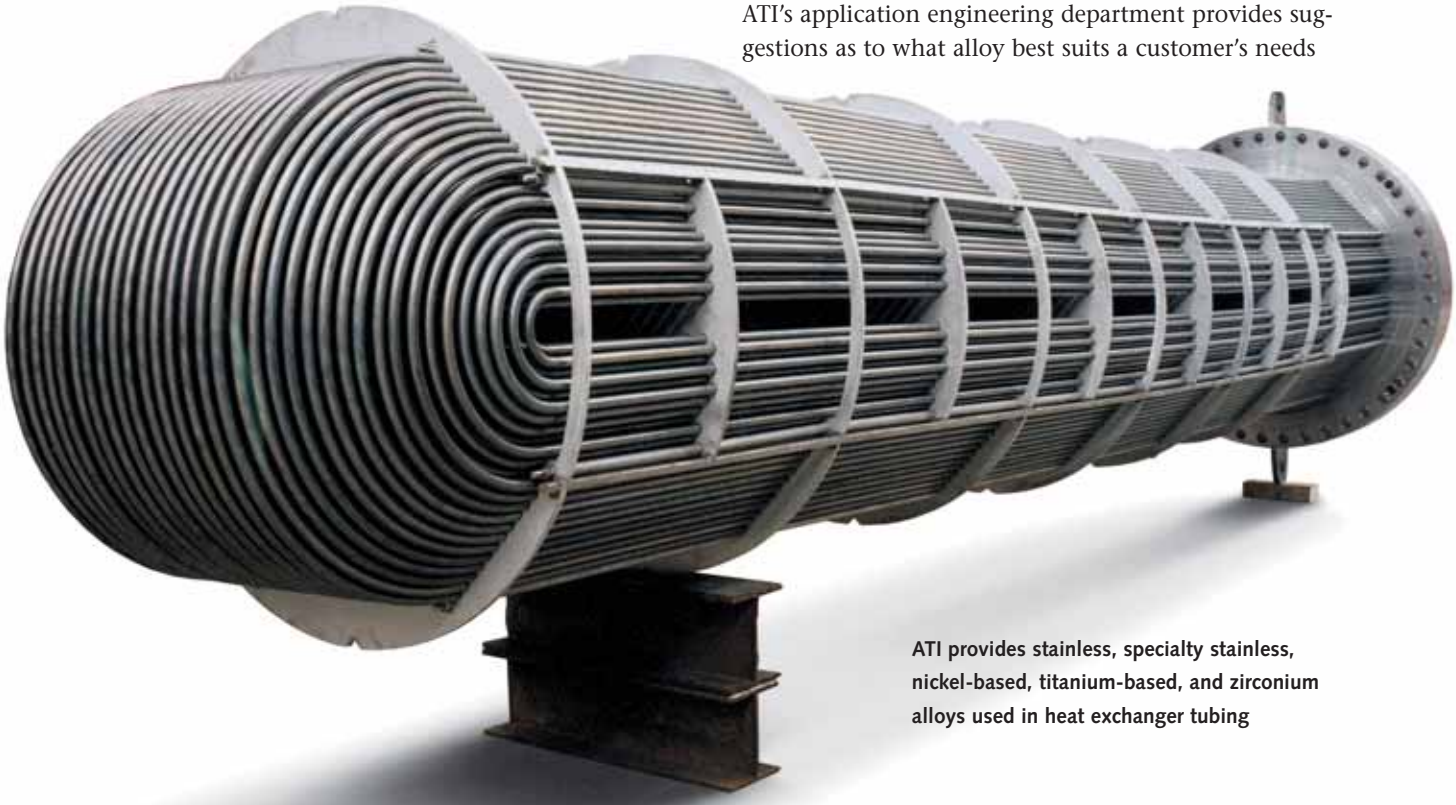
ATI is the only US company with NORSOK (the Norwegian petroleum industry) certification. ATI Allegheny Ludlum is certified as a qualified producer of AL2003™, AL2205™, and AL-6XN® alloys in strip and plate product forms under NORSOK Standard M-650. In addition, ATI's titanium castings are NORSOK qualified. NORSOK standards have been developed by the Norwegian petroleum industry to identify materials used in oil and gas applications that are safe and cost effective for existing and future petroleum industry developments. "Our duplex, lean duplex and 6-moly alloys provide options for the oil and gas market customers to select the optimum alloy for the application," said Mr. Hassey.

The AL 2003 alloy provides an excellent substitution for Type 316L stainless steel, which has become very expensive due to the currently high and volatile prices of raw materials. "Our lean duplex AL 2003 alloy contains only 3%-nickel compared to 10%-nickel in Type 316L stainless steel and 5%-nickel in other duplex alloys. Though less expensive due to raw material surcharge, it can do the same job as well as and often better than those with a higher nickel content. For example, in some instances design engineers have saved up to 1/3 of weight by using the stronger lean duplex alloy.

"We have a lot of metallurgical engineers and technically-trained sales professionals working closely with customers to help them find the optimal materials for their applications. One of the main areas we are focusing on is Type 304 stainless, the most common grade of stainless steel, which contains 8%-nickel. Our alternative is our AL 201HP™ alloy, which we have been making for some fifty years. It has just 4%-nickel, providing significant cost savings and in most cases equal performance as compared to Type 304. We have demonstrated to a lot of our customers in Europe and the US that this is an excellent alternative."

ATI is thus developing a whole series of alloys to meet the specific needs of its customers around the world. "We feel so strongly that customers can benefit from our lower nickel-bearing alloy flat-rolled product options that we have developed a marketing campaign with the theme 'The Switch is On™.'"

ATI's application engineering department provides suggestions as to what alloy best suits a customer's needs



ATI provides stainless, specialty stainless, nickel-based, titanium-based, and zirconium alloys used in heat exchanger tubing

ATI's tungsten carbide products are used for drill bits in the oil and gas market

in terms of strength, flexibility or corrosion resistance. "We make suggestions based on our discussions with customers. They may come to us for advice because a material they have chosen is too expensive or poses problems such as long delivery times. Our engineers will come up with a substitution that best fits their needs. Customers are not always knowledgeable about the alternatives available today, and they want to know what's new and what's available. They are searching for new solutions. An example would be suggesting that a customer use a corrosion-resistant stainless steel or nickel-based alloy as a substitute for an expensive or hard-to-get titanium alloy. For example, in the desalination or marine sectors, some corrosion resistant titanium and nickel-based alloys can be replaced by our 6-moly alloy or our AL 29-4C® superferritic alloy. We have the technical capability with our materials engineers and extensive corrosion laboratories to help our customers decide on the optimal, most cost effective specialty metal solution for them."

Global expansion

The combination of Allegheny Ludlum Corporation and Teledyne, Inc. in 1996 brought together the technology of both companies and provided a very strong selling arm throughout Asia and Europe. The company now includes ATI Europe and ATI Asia with each branch being staffed with local personnel.

"They speak the local languages and understand the customs, the customers, the politics, and the economic environment of those countries" explains Mr. Hassey. "For example, our staff in China has the knowledge to represent all of our ATI products, whether it's our exotic metals company or our flat-rolled products sector. We provide everything from tooling, round products, flat-rolled products, and tubular products to stainless steel commodity products and wire. So these staff can draw on the resources of the whole company, including ATI Allvac, ATI Allegheny Ludlum, ATI Wah Chang, and ATI Metalworking Products."

"We believe that we need to sell globally but have a local presence to meet the needs of the customer base in that particular part of the world. This international sales organisation reports directly to an executive vice-president in Pittsburgh who runs this operation using the asset base of all our companies. It has been so effective that today we generate 25% of our direct sales outside the US, and in the future we expect our non-US direct sales to top 30%."

Allegheny Technologies continues to invest in new equipment and capacities. Examples of this are its recent investments in titanium sponge facilities in the US. ATI recently began Phase I operations at its Albany, OR titanium sponge facility and has announced two additional expansion phases at Albany. In addition, in June ATI announced that its Board of Directors had approved plans for a greenfield titanium sponge facility in Utah. In addition, ATI recently began operation of remelt furnaces, which are part of its nickel-based alloy and superalloy expansion. By the time supporting equipment and mill products are included, the company will have invested over USD 500 million in strategic growth capital investments between 2005 and 2008.

"ATI leads the world in the technology for melting and producing mill products in most forms for high-performance and exotic metals" continues Mr. Hassey enthusiastically. "We are unsurpassed in our ability to basically take zircon sand to create a metal for an artificial knee, or to make a rod from which our customer creates a wire stent for inside a human heart, or to make a product that will allow our customer to go several thousand feet into the earth to retrieve the resources we need to run this world. We are a very unique specialty metals company. As our markets go through cycles of growth and retraction we endeavour to balance our access to these markets to create value for our customers." ■

Facts & Figures

Name: Allegheny Technologies Incorporated (ATI)
Established in: 1934
Key markets: Aerospace and defence, chemical process industry, oil and gas, electrical energy, medical, automotive, construction and mining, and food equipment and appliance
Major products: Titanium and titanium alloys, nickel-based alloys and superalloys, stainless and specialty steels, zirconium, hafnium and niobium, tungsten materials, grain-oriented silicon electrical and tool steels, and forgings and castings.
Principal locations: USA, China, United Kingdom, Germany, Taiwan
Employees: 9,300
Turnover: $4.0 billion during the most recent four quarters ending June 30, 2006.