

GLOSSARY OF TERMS

ATI Business System (ATIBS)

A systemic and integrated business system adopted throughout ATI, and built on three fundamental principles: Make to Use, Elimination of Waste, and People Connect the System.

Ammonium Paratungstate (APT)

A purified intermediate tungsten compound made from ore or recycled tungsten scrap that is used as a starting material for making most tungsten powders.

Annealing

The process of heating and cooling metal in such a way as to soften it, and to produce desired changes in other properties or microstructure.

Bar

A long product that is 1/4 inch (6.35 mm) or more in diameter, having round, square, octagonal or hexagonal cross-sections.

Billet

A long product with a diameter range of 8 to 14 inches (203 to 356 mm). Can either be sold in billet form or processed further to make other long products.

Carbide Cutting Tools

Cemented carbides made into forms for removing materials in machining operations, such as turning, milling or drilling. Normally, these tools have hard surface coatings consisting of carbides, nitrides and oxides of titanium and aluminum.

Casting

A product formed by pouring liquid metal into a near-net-shape mold and allowing it to cool and solidify. ATI produces large gray and ductile iron castings as well as titanium and zirconium rammed-graphite castings to exact customer specifications. Our large gray and ductile iron castings are used for applications such as wind energy components, locomotive engine blocks, and valves and other components used in the oil and gas market. Our titanium and zirconium rammed-graphite castings are used in marine and defense applications as well as pump components for the chemical process industry.

Electric Arc Furnace (EAF)

An open air melting furnace in which scrap and ferroalloys are melted by high electrical power carbon arcs. Refining is accomplished by slags and various gases. The process is often used in conjunction with subsequent refining processes.

Electron Beam Furnace (EB)

A melting furnace that uses high-energy electron beams in a vacuum environment to melt metals into a water-cooled crucible and is especially useful for titanium and exotic alloys.

Electroslag Remelt (ESR)

A consumable electrode remelting process in which an AC current is passed from an electrode through a molten slag pool. Molten metal droplets fall through the slag and solidify in a water-cooled copper crucible. This process is utilized to improve both the cleanliness and structure of alloys.

Exotic Alloys

The Company's classification for its products, which includes zirconium, niobium and hafnium.

Flat-Rolled Products

A product form classification that includes plate, sheet, strip and Precision Rolled Strip® products.

Forging

A product formed by compressive forces to plastically deform metal into a shape. ATI produces forgings as mill products such as titanium alloy, nickel-based and

superalloy, and specialty alloy billet. ATI also produces carbon and alloy custom compression die hot forgings for applications in the transportation, construction and mining, and oil and gas markets.

Forging Press

A press, usually vertical, used to operate dies to deform metal plastically. May be mechanically or hydraulically operated and either closed die for shaped, part forgings or open die for cogging.

GFM Precision Rotary Forge and Radial Forge

A forging process where rapid simultaneous action of forging hammers subjects the workpiece to a high rate of deformation under uniform compressive stressing. The control and reproducibility of the GFM process is designed to provide optimum metallurgical consistency.

Grain-Oriented Electrical Steel (GOES)

Iron-based alloys containing silicon (typically 3.5%) as the major alloying addition. These steels are used generally in applications such as power distribution and power generation transformers where electrical conductivity and magnetic properties are important.

Hafnium

An exotic alloy usually obtained as a by-product of zirconium production with outstanding corrosion resistance and good mechanical properties. It is added to specialty alloys for use in jet engine parts and as control rod material in nuclear reactors.

High-Performance Metals

A classification that includes ATI's nickel-based and cobalt-based alloys and superalloys, titanium and titanium alloys, specialty alloys, and exotic alloy products, primarily in the form of long products. These products typically exhibit any of the properties of high temperature resistance, high strength, and high temperature oxidation resistance.

High-Value Flat-Rolled Products

A classification that includes ATI's Flat-Rolled Products segment's titanium and titanium-based alloys, nickel-based alloys and superalloys, specialty alloys, grain-oriented electrical steel, engineered strip and Precision Rolled Strip® products. These products typically are characterized by direct technical and service relationships with customers.

Hot Isostatic Pressing (HIP)

A process of pressing/consolidating powder metals under the simultaneous application of temperature and pressure (equally applied in all directions) to yield 100% dense parts made of specialty metal powders, such as titanium, nickel, and stainless steel alloys.

Ingot

A product form resulting when molten metal is cast into molds, which can be round, square, or rectangular. Can either be sold in ingot form or processed further to make higher value mill products.

Long Products

A product form classification that includes ingot, billet, bar, rod, wire and seamless tubing and custom-rolled shapes.

Market Sector Team

An ATI initiative whose goal is to integrate and coordinate ATI's global capabilities to offer current and new customers access to the Company's full range of products, processes, and technical resources. Current ATI Market Sector Teams include ATI Aerospace, ATI Defense, ATI Oil & Gas, and ATI Nuclear Energy.

Nickel-Based Superalloys

Nickel alloys, having nickel as the primary constituent, developed for very high temperature service where relatively high mechanical stresses are encountered and where high surface stability is frequently required. Typical applications are aircraft turbine and land-based turbine components.

Niobium

An exotic alloy valued for its strength at extremely high temperatures and its ability to superconduct, or pass electricity with minimal resistance, at very low temperatures. It is used in aerospace applications, in superconducting magnets in MRI (magnetic resonance imaging) equipment, when alloyed with titanium, and in particle accelerators.

Pickling

The process of using various acids and acid mixtures to remove scale that can form on specialty metals during processing at elevated temperatures (such as hot rolling or annealing).

Plasma Arc Melt (PAM)

A melting furnace that is a superior cold-hearth melting process for making alloyed premium titanium products for jet engine rotating parts, medical applications, and other critical applications.

Plate

A flat-rolled product that is 3/16 inch (4.76 mm) thick, or greater, and over 10 inches (254 mm) wide.

Powder Metallurgy

The production of specialty metals products by processes including the steps of atomizing, screening, blending, and pressing to consolidate metal powders.

Precision Rolled Strip® Products

Flat-rolled products including stainless, nickel alloys, titanium and titanium alloys, and carbon steel under 0.015 inch (0.38 mm) thick and up to 48 inches (1,219 mm) wide, as well as certain strip products with special tempers and thicknesses.

Raw Materials

Used in the production of ATI's specialty metals and include recycled scrap metal (containing iron, nickel, chromium, titanium and molybdenum), nickel, titanium sponge, zirconium sand and sponge, ferrochromium, ferrosilicon, molybdenum and its alloys, ammonium paratungstate, tungsten scrap, tungsten ore, manganese and its alloys, cobalt, niobium, and other alloying materials.

Rod

A long product that is from 0.118 inch (3 mm) to 3/4 inch (19 mm) in diameter.

Ruthenium

A transition metal added to tungsten carbide cutting tools to improve the resistance to thermal cracking and plastic deformation.

Sheet

A flat-rolled product that is 24 inches (610 mm) and over in width and less than 3/16 inch (4.76 mm) thick.

Stainless

A broad classification of iron-based alloys containing at least 10% chromium, known for excellent corrosion and heat resistance. Austenitic (Chrome-Nickel) grades contain 16% to 30% chromium and 4% to 20% nickel for enhanced surface quality and formability and increased corrosion and wear resistance. These grades are used in appliances, kitchen utensils, processing equipment and a variety of industrial applications. Ferritic (Chrome) grades are non-nickel-bearing and contain 11% to 17% chromium content for greater inherent strength and corrosion resistance than carbon steel. These grades are often used in automotive exhaust systems.

Standard Flat-Rolled Products

A classification that includes ATI's Flat-Rolled Products segment's stainless hot- and cold-rolled sheet, strip, and plate products.

Strip

A flat-rolled product 3/8 inch (9.5 mm) to under 24 inches (610 mm) wide and less than 3/16 inch (4.76 mm) thick. See also Precision Rolled Strip® Products.

Super Stainless

Stainless alloys with significant additions of chromium, nickel, molybdenum or copper. Super stainless is used in chemical processing, oil and gas, marine, heat treating, pollution and waste control industries where there are requirements for extra corrosion protection, strength or heat resistance.

Superalloy

An alloy, usually based on nickel, cobalt or iron, developed for high temperature service where relatively severe mechanical stress is encountered and where high surface stability is frequently required.

Titanium

Titanium and its alloys have very high strength-to-weight ratios. At normal temperatures, they have high resistance to corrosion. Used primarily in aerospace and defense, chemical processing industry, oil and gas, and medical markets.

Titanium Sponge

Titanium sponge is a critical raw material used to produce titanium mill products. ATI produces titanium sponge using the Kroll Process, which reduces titanium tetrachloride with magnesium. The titanium sponge with or without the addition of titanium scrap is melted into ingots or slabs.

Tungsten Carbide Graded Powders

Tungsten carbide powder, made by blending with other powder constituents like cobalt, tantalum carbide, and niobium carbide to obtain a desired composition and carbide grain size. These powders are pressed to a desired shape and then sintered in the range 1350 degrees to 1500 degrees Centigrade to yield a cemented carbide part.

Tungsten Materials

Include tungsten and tungsten carbide powders, sintered tungsten carbide products and cutting tools for the mining, oil and gas, and other industries requiring cutting tools with extra hardness.

Vacuum Arc Remelt (VAR)

A consumable remelting process in which a high current DC arc is maintained under vacuum between an alloy electrode and a molten metal pool contained in a water-cooled copper crucible. Sequential melting produces an ingot with good internal structure, good surface finish, and excellent chemical homogeneity.

Vacuum Induction Melt (VIM)

A melting process that uses an induction furnace inside a vacuum chamber to melt and cast nickel-based alloys, superalloys, and specialty alloys. The process is normally used for grades which require a high alloy content, precise chemistry control and low impurity levels.

Wire

A long product that is from 0.030 inch (0.76 mm) to 1/4 inch (6.35 mm) in diameter, in round, square, octagonal or hexagonal cross-sections.

Zirconium

An exotic alloy valued for its strength, high corrosion resistance, and low thermal neutron absorption. Applications include nuclear reactors, marine vessels, commercial power generation, and those requiring contact with strong acids and basic environments.