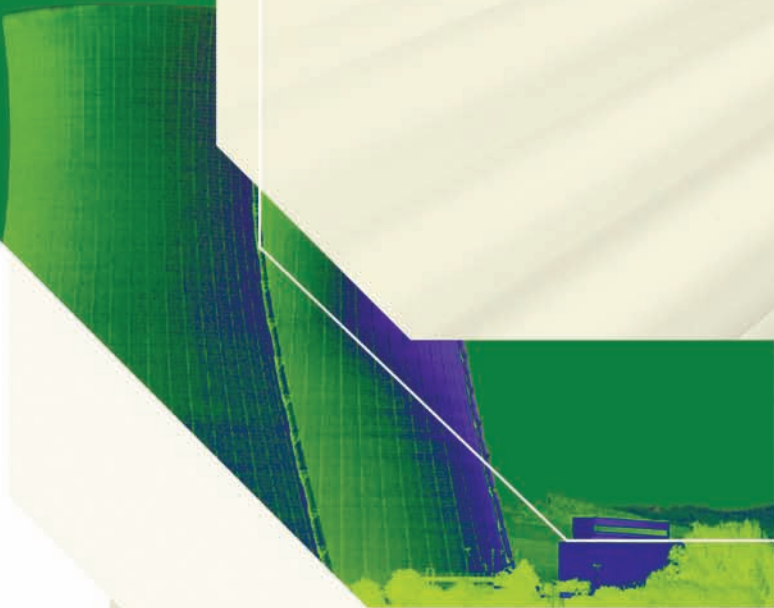
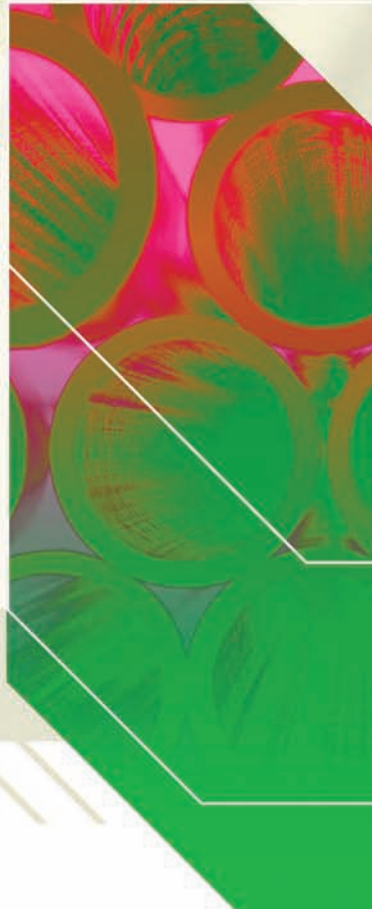


Metallics for Sustainable Energy





 **ATI Nuclear Energy**



ATI's titanium, stainless and specialty alloys, nickel, zirconium and tungsten heavy alloys deliver excellent strength, corrosion resistance and radiation shielding for applications from the reactor core to spent fuel storage.

Metallics for Sustainable Energy

The growing global demand for safe, sustainable energy has created a renaissance in nuclear power as the world seeks cleaner, environmentally-friendly, energy-generating alternatives.

ATI Nuclear Energy, a premier supplier of metallic solutions for nuclear applications, is ready to help its customers prepare to build hundreds of new plants around the world – and extend the service life of existing, licensed facilities.

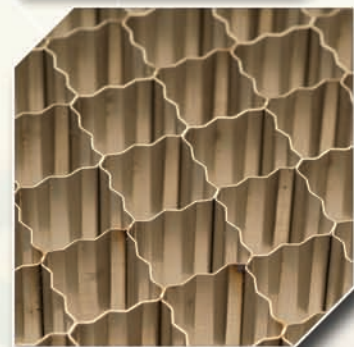
ATI offers unique product breadth, technical depth and unsurpassed manufacturing capabilities satisfying the precise, uncompromising requirements of the nuclear industry for corrosion resistance, radiation shielding, quality, strength and performance.

Our products enhance the performance of reactors and reactor vessels, steam generators, turbines, cooling towers, wet- and dry-pool storage, transport vessels and repositories.

We manufacture zirconium, hafnium, niobium, titanium and nickel-based alloys, stainless, tungsten heavy alloys and other essential metallics for components such as fuel cladding, fuel bundle components, control rods and blades, condenser tubing, containment pumps, heat exchangers and containment vessels. Some of our major products are used to provide long-term storage of spent nuclear fuel and high-level waste.

ATI Nuclear Energy provides a geopolitically secure, stable source of supply, backed by our proven technical and metallurgical know-how, our focus on innovation and our commitment to quality assurance.

ATI understands that social progress and sufficient energy supplies are mutually dependent. We are focused on providing metallic solutions to our nuclear industry customers to help them bring sustainable energy resources to the world's citizens.





Reactor Fuel Components



Turbines



Extraction & Reduction



Meeting Customer Demands Through Unsurpassed Manufacturing Capabilities

The World Nuclear Association estimates that more than 340 new nuclear plants will be constructed around the world by 2030.

In the United States, the Nuclear Regulatory Commission anticipates receiving numerous applications to build new, pressurized and boiling light water reactor facilities at a number of projected locations.

At the same time, utilities are launching projects to modernize, relicense and extend the service and performance of plants designed decades ago.

This projected growth in the construction and modernization of nuclear power plants would boost demand for certified nuclear-grade alloys and specialty metals manufactured by a stable, reliable and trusted "one-stop" supplier – ATI Nuclear Energy.

ATI is meeting this demand and the demands of other markets which it serves, by investing more than one billion dollars to expand our production and manufacturing capabilities. From refining and reduction through melting, fabricating and finishing, ATI continues to install facilities that are unparalleled.

When you choose ATI Nuclear Energy, you choose a leader in quality, innovation and reliability. You gain access to a geopolitically secure supply base of alloys and metals that have been manufactured to your specifications.

And you choose a supplier capable of tailoring production paths and processes, meeting specified product requirements and supplying near-net-shape product forms to enable you to reduce fabrication costs.



Steam Generators

Containment

Transport Vessels

Repository



Metallics for Sustainable Energy

Melting



Fabricating



Precision Finishing



Product Breadth

- Zirconium
- Titanium
- Nickel-Based Alloys
- Specialty Alloys
- Stainless Steels
- Tungsten Heavy Alloys

Technical Depth

- Alloy Development
- New Materials
- Corrosion Engineering
- High-Temperature Metallurgy
- Surface Science
- Metallurgical & Corrosion Testing
- Failure Analysis
- Machining Specialty Metals

Unsurpassed Manufacturing Capabilities

- Extraction & Reduction – Ti, Zr
- Melting – PAM/EB/VAR – Ti, Zr
- VAR/ED/AOD/VIM/ESR – Ni/Steel
- Fabricating – Sheet, Plate, Extrusions, Forged & Cast Products
- Tube and Pipe
- Precision Finishing & Machining

Value-Added Resources

- Next-generation Applications
- Integrated & Controlled Supply Chain
- Material & Product Optimization
- Application Engineering
- Contract R&D
- Long Term Agreements
- Engineered Parts
- Cutting Tool Solutions

Investing to Meet Customer Needs

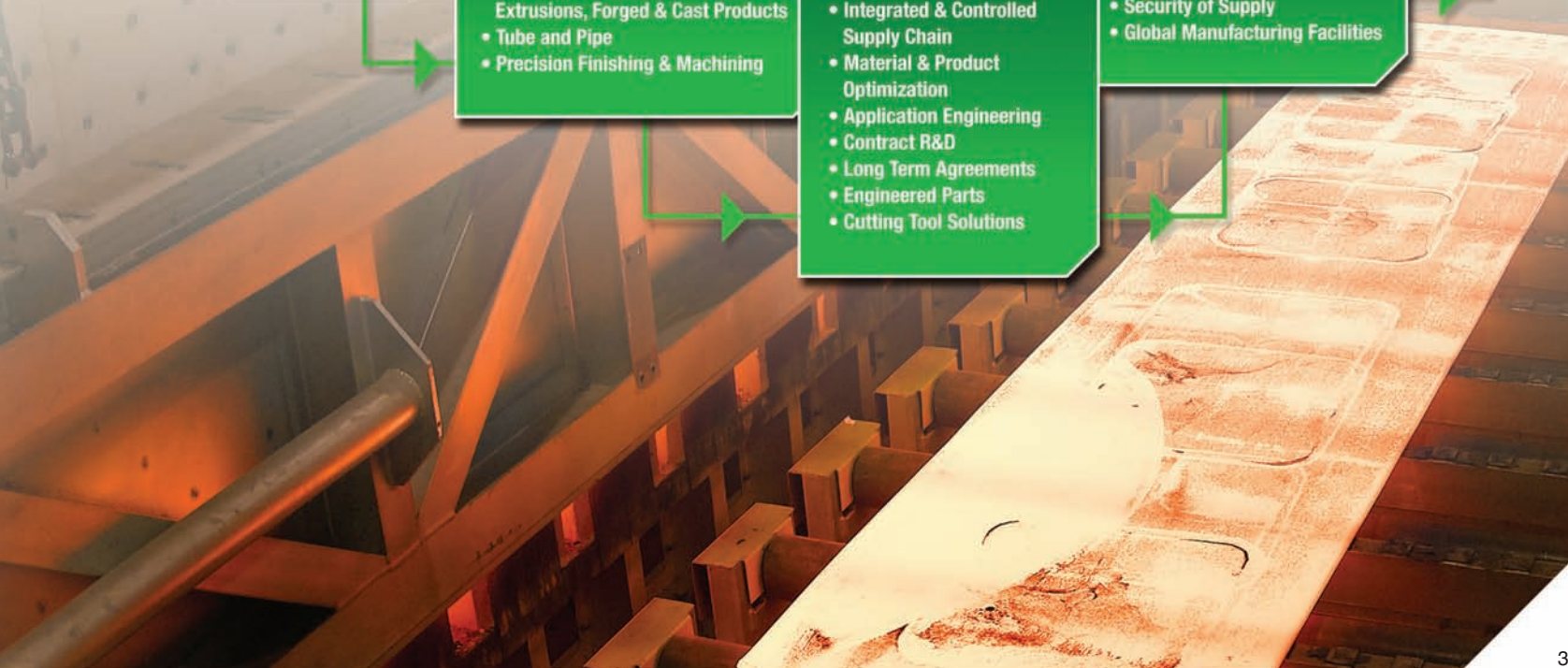
- Greenfield & Brownfield
- Stable Value Chain
- Reliable
- Security of Supply
- Global Manufacturing Facilities

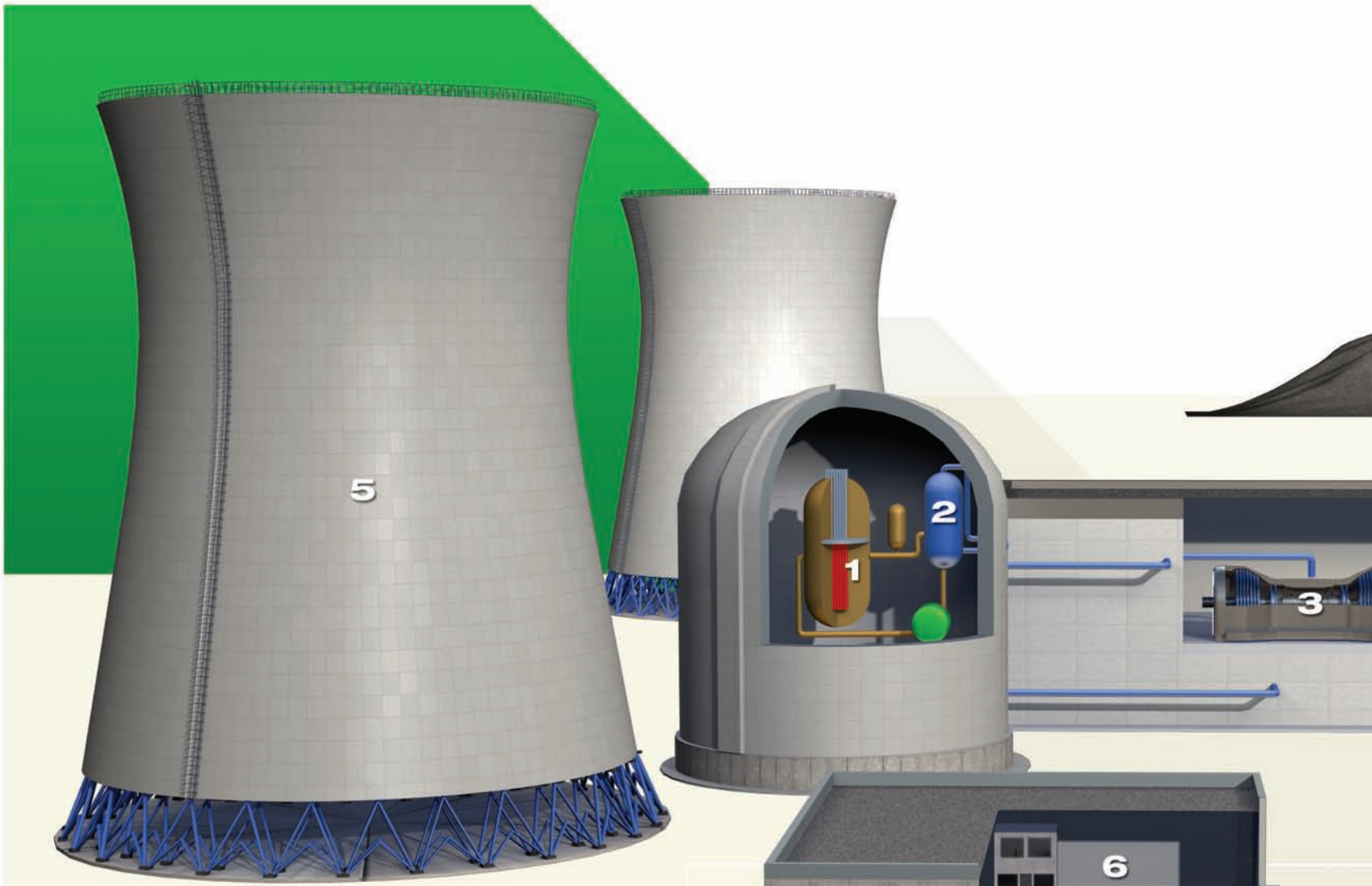
Enabling Sustainability

- Efficient Energy Transmission
- Improved Resource Extraction
- Enhanced Fuel Efficiency & GHG Performance
- Demanding Environments
- Recyclable
- Renewable and Sustainable Energy Generation
- Value-Added By-Products
- Longer Product Life



Integrated Capabilities





Full Cycle of ATI Metallics for Nuclear Energy

1 Reactor Vessel

- Control Rods
-Hafnium Alloys
- Fuel Bundles
-Zirconium Alloys
- Instrumentation and Seals
-Nickel Alloys
- Pressure Vessel Material and Piping
-Stainless and Specialty Alloys
- Emergency Cooling System
-Stainless Alloys
- Fuel Assembly
-Nickel Alloys
- Reactor Internals
-Nickel Alloys

2 Steam Generator

- Divider Plate
- Stainless Alloys
- Tubesheets
- Nickel Alloys
- Tubing
-Nickel Alloys

3 Steam Turbine

- Specialty Alloys
- Titanium Alloys
- Nickel Alloys

4 Generator

- Stainless Alloys
- Nickel Alloys

5 Cooling Tower (Internal Components)

- Stainless Alloys
- Specialty Alloys

6 Wet Pool Storage

- Stainless Alloys
- Nickel Alloys
- Tungsten Heavy Alloys

7 Dry Storage

- Stainless Alloys
- Titanium Alloys
- Armoring Materials
- Grey & Ductile Iron Castings

8 Transport Vessel

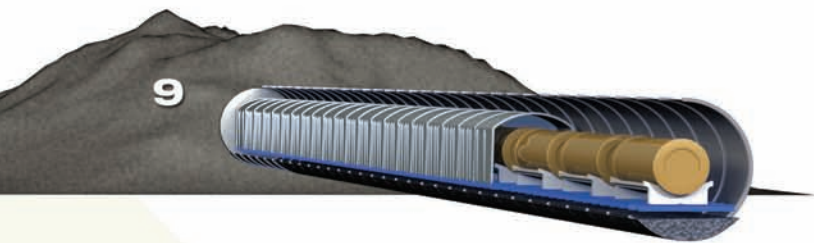
- Stainless Alloys
- Titanium Alloys
- Armoring Metals
- Grey & Ductile Iron Castings

9 Repository

- Stainless Alloys
- Titanium Alloys
- Nickel Alloys
- Zirconium Alloys
- Hafnium

Balance of Plant

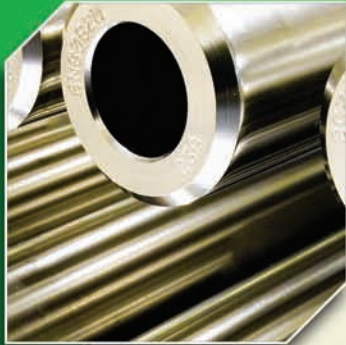
- Service Water Piping
-Stainless Alloys
- Feedwater Heaters
-Stainless Alloys
- Condenser System
- Stainless Alloys
- Titanium Alloys
- Heat Exchangers
-Stainless Alloys
-Titanium Alloys
-Nickel Alloys
- Containment
- Stainless Alloys
- Turbine Moisture Separators
- Stainless Alloys
- Pumps
-Stainless Alloys
-Nickel Alloys
-Tungsten Heavy Alloys
- Spent Fuel Rods
- Stainless Alloys



ATI Nuclear Energy has the strength, resources and vision to support the development and growth of nuclear energy as a reliable, sustainable source of energy.

A Few Good Reasons to Partner with ATI Nuclear Energy

- *ATI proprietary alloys and specialty metals enhance plant performance with superior metallurgical and structural properties.*
- *Our products provide structural integrity for complex reactor components and perform well in highly demanding nuclear energy environments.*
- *We have a strong track record of collaborating with major companies in the nuclear power construction, management and supply market.*
- *ATI is expanding our production capabilities and capacity to support the future growth of the nuclear energy industry.*
- *We offer unparalleled breadth and unique mix of products and product forms for a wide range of nuclear applications.*
- *ATI is a fully integrated manufacturer with facilities in the U.S. and Western Europe, offering secure and stable supply with reliable lead times.*
- *We are focused on solutions and product innovations that improve your processes.*
- *We have the technical experience, R&D and people to support your needs.*
- *We are a core business of ATI, a leading global specialty metals and alloys producer.*



Metallic Solutions

ATI is accredited by the Nuclear Industry Assessment Committee (NIAC) and delivers the widest range of high-performance alloy and specialty metal solutions for the most challenging nuclear applications and environments.

Our leading nuclear products include:

Zirconium – With low thermal neutron absorption, nuclear grade Zircaloy is the alloy of choice for fuel cladding, end pins, fuel bundle components and core pressure tubes. Our family of Zircaloy products delivers excellent corrosion resistance in high temperature steam and water environments, as well as dependable strength.

Hafnium – A vital corrosion-resistant metal that is used in fission reactor control rods, blades and safety applications because of its ability to absorb neutrons.

Niobium – Used as an alloy additive to increase strength and corrosion resistance in zirconium alloys.

Tungsten Heavy Alloys – These high-mass alloys are ideal for shielding and transport applications because they reduce the risk of exposure to radioactivity. ATI manufactures and casts alloys so they can be machined for use in nuclear components, such as tungsten-impregnated polymers that are wrapped around pipes.

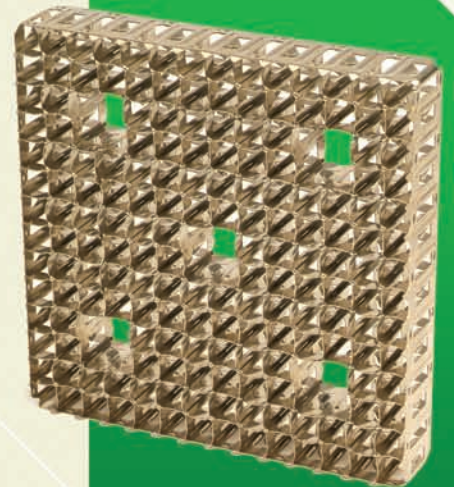
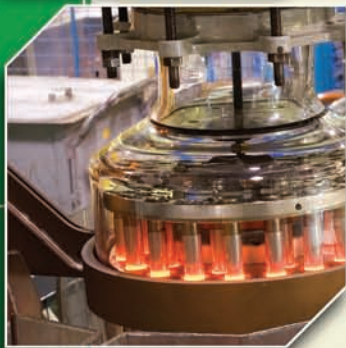
Titanium and Nickel-Based Alloys – ATI manufactures these for a variety of nuclear applications, from condensers, heaters, and heat exchangers to water handling and piping systems.

Stainless Steels – ATI manufactures Super Ferritic and Super Austenitic stainless alloys for applications such as tubing, piping, condensers and other applications where corrosion resistance is a must.

Our products are manufactured and engineered to stringent certification standards in many fabricated forms, including:

- Slab, plate and sheet
- Ingot, billet and bar
- Strip and foil
- Rod, tube and wire
- Extrusions, forgings, castings and custom, near-net shapes

With metallic nuclear solutions that are second to none, ATI Nuclear Energy should be your choice when your core mission is maintaining, upgrading or building superior – and safe – nuclear power plants in the 21st century.



ATI manufactures nuclear grade zirconium sheet for spacer grids used to separate fuel rods in PWR fuel assemblies.

Delivering Energy and Excellence Through Innovation

To support customer needs, ATI is committed to process and product innovation that will play a key role in the future of the nuclear power industry – from the reactor core to spent fuel storage.

Our nuclear-grade metallics are engineered for maximum corrosion resistance, strength, durability and performance. Building upon our metallurgical experience, we continue to make breakthroughs in alloys and processes.

At ATI Nuclear Energy, we have the best people in our industry, the most experience and the proven technical know-how that separates us from others.

- We have a longstanding focus on innovative metals solutions and new product development.
- We can rapidly prototype new alloys to meet international standards and quality certification requirements.
- Our laboratories provide analytical services and testing to confirm that our alloys meet product specifications.



1. Advanced stainless, nickel and tungsten heavy alloys made by ATI are used in the construction of wet-pool storage.
2. Innovative titanium and stainless steel alloys developed by ATI are proven metals of construction for spent fuel containment and storage.
3. ATI Nuclear Energy meets stringent quality certification standards by adhering to strict material testing guidelines.
4. ATI's global team of metallurgists, chemists and engineers work with customers to develop and test alloys suitable for nuclear energy applications.

- We are an industry leader in conducting applied research with and for our customers.

Our success is built on a foundation of strong long-term customer relationships and our focus on quality. We work collaboratively with you to design and manufacture products that meet product specifications as well as the stringent certification standards of organizations, such as:

- Nuclear Industry Assessment Committee (NIAC)
- National Association of Corrosion Engineers (NACE)
- American Society of Mechanical Engineers (ASME)
- American Standards for Testing Materials (ASTM)
- National Quality Assurance (NQA)

No other specialty metals company offers a greater breadth of advanced metallic solutions and capabilities for nuclear applications, backed by our commitment to R&D and the best people in the specialty metals industry.

ATI can deploy a dedicated team of hundreds of metallurgists, chemists, engineers and staff members across our company to collaborate with nuclear customers on meeting their product and performance requirements. We also have quality assurance personnel that review incoming orders and quality requirements for nuclear energy applications.



Our Nuclear Team

ATI Nuclear Energy represents the combined capabilities of the people and facilities in our operating companies.

ATI Wah Chang is a leading manufacturer of zirconium, hafnium, niobium and titanium-based alloys and products. Customers have relied on Wah Chang for nuclear control and containment materials for more than 50 years. Its products include a wide variety of nuclear grade zirconium and titanium alloys for use in fuel cladding and repository applications.



ATI Allegheny Ludlum is a leading producer of specialty, flat-rolled stainless steels, nickel-based alloys and its own brand of high performance alloys. It manufactures a variety of corrosion resistant stainless steels for nuclear power plant piping systems and condensers. AL-6XN[®] alloy has been a stalwart material in the cooling systems of power plants facing salt water and other corrosive environments.



ATI Allvac is a major supplier of corrosion resistant titanium and nickel-based alloys that are used in a variety of critical nuclear applications, from condensers, heaters, and heat exchangers to water handling and other piping systems. Its products include nickel-based ATI 600 and 690 alloys for piping, pressure vessel and waste treatment applications. It commercialized vacuum induction melting for manufacturing nickel-based alloys, and provides electron beam and premium plasma arc melting for titanium-based products.

ATI Engineered Products is a producer of tungsten heavy alloys, tungsten, tungsten powders, castings and forgings, as well as sintered tungsten carbide for cutting, machining and drilling tools.

For more information on how ATI Nuclear Energy can fuel your success, visit our website at www.alleghenytechnologies.com.

When thinking about your next project, save yourself time and money by harnessing the resources ATI Nuclear Energy has to offer.





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