Industry Close Up

Data Centers

October 2025

Tony Palermo, VP Commercial for New Castle Stainless Plate recently shared insights relating to the growing demand for stainless steel in projects supporting the energy and cooling sources for data centers. Here's what Tony had to say about this booming market and the opportunities for stainless.

Question: How is artificial intelligence (AI) impacting the demand for energy to power data centers?

Answer: AI data centers require significant amounts of power to train the advanced models that perform AI computations. This extreme workload is demanding exponentially more power than that consumed by data centers simply storing and retrieving information. Some experts predict that energy demand for AI data centers could double to as high 9-12% of the entire U.S. energy demand by 2030. In the U.S. alone, there are more than 5,400 data centers, accounting for about 4% of our current energy demand in the U.S.

Q: Is all this power required just for the computations?

A: No. Energy is also required to cool the super computers used to generate AI. As much as 38% of the energy required to run an AI data center is devoted to the system that cools the processors, chips, and other computational and modeling equipment.

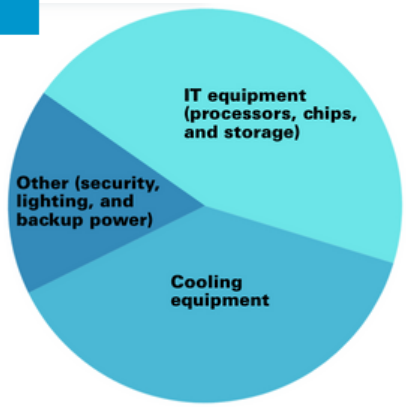
Q: Is there anything unique about this power demand, aside from its sheer volume?

A: Unlike other power demands, AI data centers must have consistent and reliable energy. A brown-out is not an option. So clean energy options like wind and solar are less favorable. The reliability of nuclear as a clean energy source is a strong consideration.

Q: What is the government and the private sector doing to meet this energy demand?

A: President Trump wants to see the U.S. maintain its leadership position in AI generation, calling it "world domination." He views AI as a form of national security which has led to several executive orders and Department of Energy announcements paving the way for public-private collaborations exploring nuclear energy options to power data centers.

New Castle Stainless Plate, LLC



316H Stainless Steel

- Ni % = 10.0 – 14.0
- Cr % = 16.0 – 18.0
- Co/Mo % = -/2.0 – 3.0
- Max temp for 100K hr = 1350 °F (700°C)

Stainless steels for components directly exposed to radioactive materials:

- **304/316L/316H for vessel internals, cladding, and structural supports in nuclear reactor pressure vessels.**
- **Borated 304B/316B for liners, racks, and pool structures for the spent fuel storage.**
- **304 and 316L for piping, pumps, valves, and heat exchangers for the cooling systems.**
- **•304L, 316L, and 2205 for the waste containers, drums, processing equipment, hot cells, and shielded boxes for the decommissioning and waste processing aspect of the nuclear reactor.**

Q: How does the boom in AI data centers impact the sale of stainless steel plate?
A: Data centers themselves are not big consumers of stainless steel. But the energy sources, the back-up systems, and to a lesser extent the cooling systems for data centers present massive opportunities for stainless steel applications.

Q: Can you provide some examples of these nuclear opportunities?
A: In President Trump's Executive Order from May 2025, he referenced advanced nuclear reactors and systems like the Gen III+ reactors as well as small modular reactors. A number of Gen III reactors are in development around the world. These reactors operate at high temperatures. 316H, with very low cobalt content, performs well in these reactor environments with operating temperatures up to 1350 °F (700°C).

Q: Are there applications for stainless in the spent fuel storage phase of nuclear power?
A: Yes. Spent fuels are initially cooled in pools (known as wet storage) for about five years before moving into dry storage. Wet storage is essentially a large stainless steel-lined pool with compartments of spent fuel separated by more stainless steel. Dry storage is a large cask of thick stainless steel plate that contains bundles of used fuel assemblies within a stainless steel canister. New Castle Stainless Plate supplies thick plate in 304 grade for these storage canisters.

Q: Are tech companies embracing the idea of nuclear energy as a source for providing power for their large data centers?
A: Yes. We are already seeing big tech companies collaborating with energy companies to generate nuclear power close to their data centers or adjacent to the electric grid. Google signed an agreement with Kairos Power and the Tennessee Valley Authority to purchase up to 50 MW of energy from the nuclear Hermes 2 Plant in Oak Ridge, TN that will be delivered to the TVA grid. Microsoft signed an agreement with Constellation Energy Corp. that will reopen the reactor at Three Mile Island Unit 1 to power data centers along the Pennsylvania-Maryland-New Jersey power grid.

LINKS: **Kairos Power press release**
Constellation press release