

Stainless for Hydrogen Applications

Hydrogen is having a moment. A report from the International Energy Agency finds “that clean hydrogen is currently enjoying unprecedented political and business momentum, with the number of policies and projects around the world expanding rapidly.” In 2022, the United States Department of Energy approved \$7 billion in federal funding relating to hydrogen infrastructure (see next article). “Stainless steel will play an important role in the infrastructure to support clean energy like hydrogen,” said Tony Palermo, Vice President, Commercial. “Stainless steel is the material of choice for every step of the hydrogen supply chain—from production to transportation and storage,” he added.

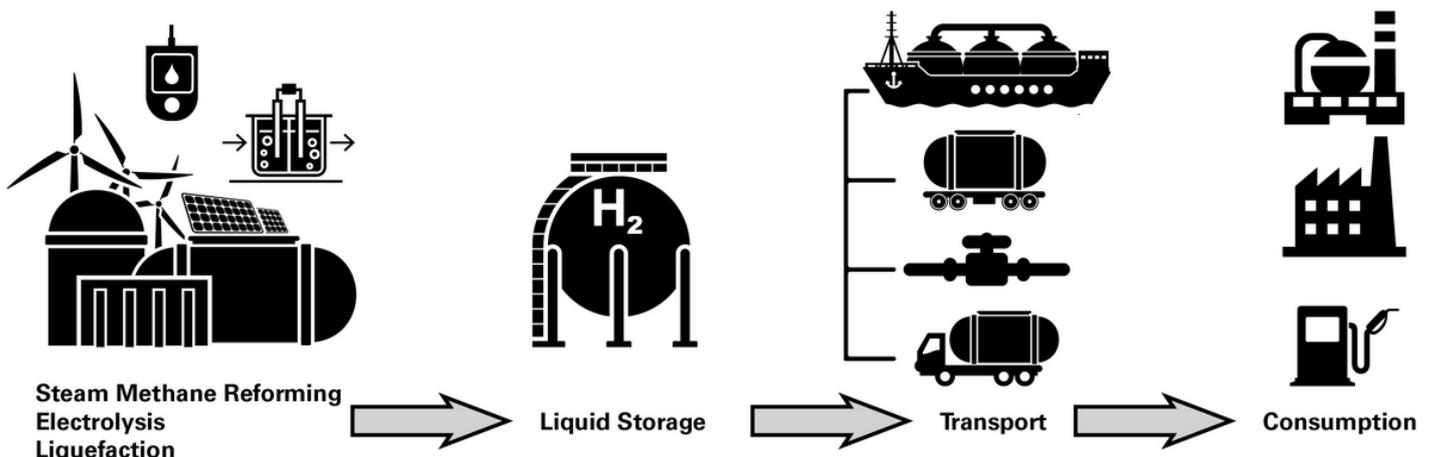
The infrastructure to support hydrogen is similar to that required for liquid nitrogen and liquid oxygen. “Nitrogen, oxygen, and hydrogen are typically transported in cryogenic liquid state, due to density considerations. In its cryogenic form, hydrogen is stored/transported at 423° below zero,” noted Palermo. Stainless steels that perform well under very low temperatures include 304, 304L, 304LN, and 316L—all available from New Castle Stainless Plate.

[LINK TO IEA Report: The Future of Hydrogen.](#)

Stainless steel is ideal for hydrogen projects requiring:

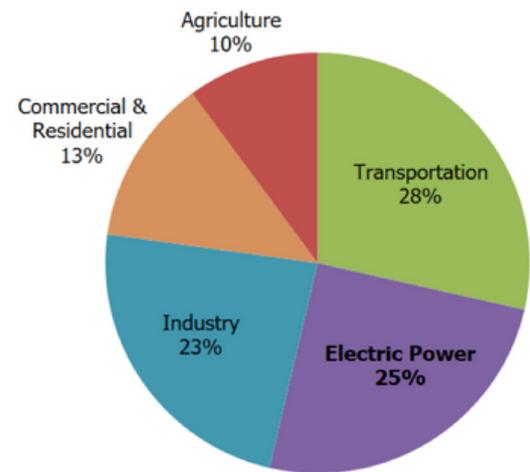
- Corrosion resistance
- Mechanical strength
- Low temperature properties

Hydrogen Production and Delivery



Hydrogen Key to Lower GHG Emissions

The goal of reducing greenhouse gas (GHG) emissions is driving demand for hydrogen applications worldwide. According to the United States Environmental Protection Agency (EPA), the transportation, industry, and electric power generation segments account for 76% of the GHG emissions in the U.S. The steel industry itself accounts for about 8%. As technologies and infrastructures advance, hydrogen has the potential to replace hydrocarbons in several key sectors. Hydrogen will replace syngas as a reductant in the processing of iron ore. Hydrogen fuel cells will replace gasoline and diesel fuels in transportation. And natural gas will be replaced by green hydrogen for the production of ammonia for fertilizers in the agriculture segment.



Source: United States EPA (2023). Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2021

DOE Announces Hydrogen Hub Spending

On October 13, 2023, the United States Department of Energy (DOE) announced \$7 billion to launch seven regional clean hydrogen hubs (H2Hubs) across the country. According to a press release on the topic, the hubs will form a critical arm of America's future clean energy economy. One of the largest investments in DOE history, the H2Hubs will form the foundation of a national clean hydrogen network vital to reducing emissions from some of the most energy-intensive sectors of our economy. These hubs are intended to address the demand-side of hydrogen to jumpstart early commercial viability of a clean hydrogen economy.

[Learn more at the DOE website.](#)

Hydrogen will be pivotal in reducing carbon emissions.



Meet Robin Teague

Robin Teague is one of New Castle Stainless Plate's awesome Inside Sales Representatives. In this role, she communicates with our customers more often than anyone else. "Robin is an excellent example of the NCSP culture and she projects this to the market," said Tony Palermo, VP Commercial.

Robin is a 35-year veteran of the New Castle facility. "I started as a temporary employee doing clerical work for the sales team," she recalled. Since then, Robin was hired on as a full-time employee and held posts in billing, accounting, production planning, warehouse (as the supervisor), and now sales. "Having served in so many roles, I have a lot of insight so I can explain the terms and our process to customers."

How has the business changed in 35 years? "There have been considerable upgrades and expansion to the site. But there has also been a lot of stability in personnel. And we are still very focused on being the easiest company to do business with!" she added.



Questions with Robin Teague

- Birthplace:** New Castle, Indiana.
- Personal Motto:** Don't let things get to you. Get through it and move on.
- Hobbies:** I have a seven-year-old grandson that I spend time with (watching sports and movies). I also like gardening, but I don't have a very green thumb!
- Favorite Stainless Application:** Big stainless rail cars, The Bean (Cloud Gate) in Chicago, and the Air Force Memorial in Arlington, VA. When people ask me what I do, I give them these examples.

Thanks for all that you do Robin,
we appreciate you!

NCSP Supports Back-to-School

Just in time for the start of the school year in Henry County, New Castle Stainless Plate supported the local Back to School Festival. Over 800 families attended, receiving a hot meal, backpacks, and school supplies as well as free haircuts, dental exams, and eye exams. "When I saw the event organizer that day, she held back tears as she thanked our team, saying 'NCSP was one of the biggest reasons that we were able to pull this off to this scale, thank you!'," recalled Tony Stewart, Inside Sales Manager.



Industry Close-Up: Hydrogen

Following the DOE announcement for \$7 billion in regional hydrogen hubs (H2Hubs), we caught up with [Tony Palermo, VP Commercial at New Castle Stainless Plate](#) for a tutorial on H2Hubs. Here is an excerpt from our conversation: "Hydrogen can be produced in multiple ways and the final legs of the distribution network draws strong parallels to existing methods for natural gas and bulk industrial gases like nitrogen and oxygen."

[Read the entire interview on our website.](#)

Industry Close Up
Hydrogen
 October 2023

Tony Palermo, VP Commercial for New Castle Stainless Plate recently commented on the United States Department of Energy (DOE) announcement for \$7 billion in regional hydrogen hubs (H2Hubs).

Question: What are the benefits of creating these regional hydrogen hubs?
Answer: To jumpstart the proliferation of hydrogen to enable reduced emissions in hard-to-abate sectors, the Department of Energy (DOE) recognized the need to connect hydrogen supply and demand. The hubs are a great step forward in bringing these critical aspects together. Producers can build new or convert existing facilities to hydrogen production plants with increased certainty that there will be future demand. The hubs provide access points for distribution, develop new pathways to hydrogen, and tap into the existing competencies of the chemical, energy, and industrial gas industries.

Q: What aspects of hydrogen infrastructure does H2Hubs address?
A: The H2Hub program aims to develop seven regional hydrogen economies that can then begin to interconnect and encourage additional hubs. Through this program, DOE is linking together producers, distributors, and end users in a coordinated and cohesive manner, greatly reducing the risk and inefficiencies that going it alone would entail.

Q: Where will these hubs be located?
A: The hub locations were announced in October 2023. They include the Appalachian Hydrogen Hub, the California Hydrogen Hub, the Gulf Coast Hydrogen Hub, the Heartland Hydrogen Hub, the Mid-Atlantic Hydrogen Hub, the Midwest Hydrogen Hub, and the Pacific Northwest Hydrogen Hub. The diversity of these locations clearly demonstrate the flexibility hydrogen solutions can bring to our climate challenge.

New Castle
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Emerging Trends for Hydrogen Applications

A number of industries are expanding their applications for hydrogen uses. These trends will continue as production of, and access to, hydrogen increases. Because of its corrosion resistance, high mechanical strength, and performance at extremely low temperatures, stainless steel is the material of choice for a number of these applications.

	Industrial feedstocks	Transportation	Power generation & energy storage	Buildings and hydrogen blending
Existing demands at limited current scales	<ul style="list-style-type: none"> Oil refining Ammonia Methanol Other (e.g. food, chemicals) 	<ul style="list-style-type: none"> Forklifts and other material-handling equipment Buses Light-duty vehicles 	<ul style="list-style-type: none"> Distributed generation: primary and backup power Renewable grid integration with storage and other ancillary services 	<ul style="list-style-type: none"> Low percentage hydrogen blending in limited regions
Emerging demands and potential new opportunities	<ul style="list-style-type: none"> Steel and cement manufacturing Industrial heat Bio/synthetic fuels using hydrogen 	<ul style="list-style-type: none"> Medium- and heavy-duty vehicles Rail Maritime Aviation Offroad equipment (mining, construction, agriculture) 	<ul style="list-style-type: none"> Long-duration energy storage Hydrogen low NOx combustion Direct/reversible fuel cells Nuclear/hydrogen hybrids Fossil/waste/biomass hydrogen hybrids with CCUS 	<ul style="list-style-type: none"> Mid to high percentage hydrogen blending in certain regions with limited alternatives Building or district heating, including fuel cells and combined heat and power, for hard to electrify or limited options

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