

Hydrogen Fuel Cell Supply Chain Expansion Through the Hydrogen Fuel Cell Nexus HFCNEXUS.COM

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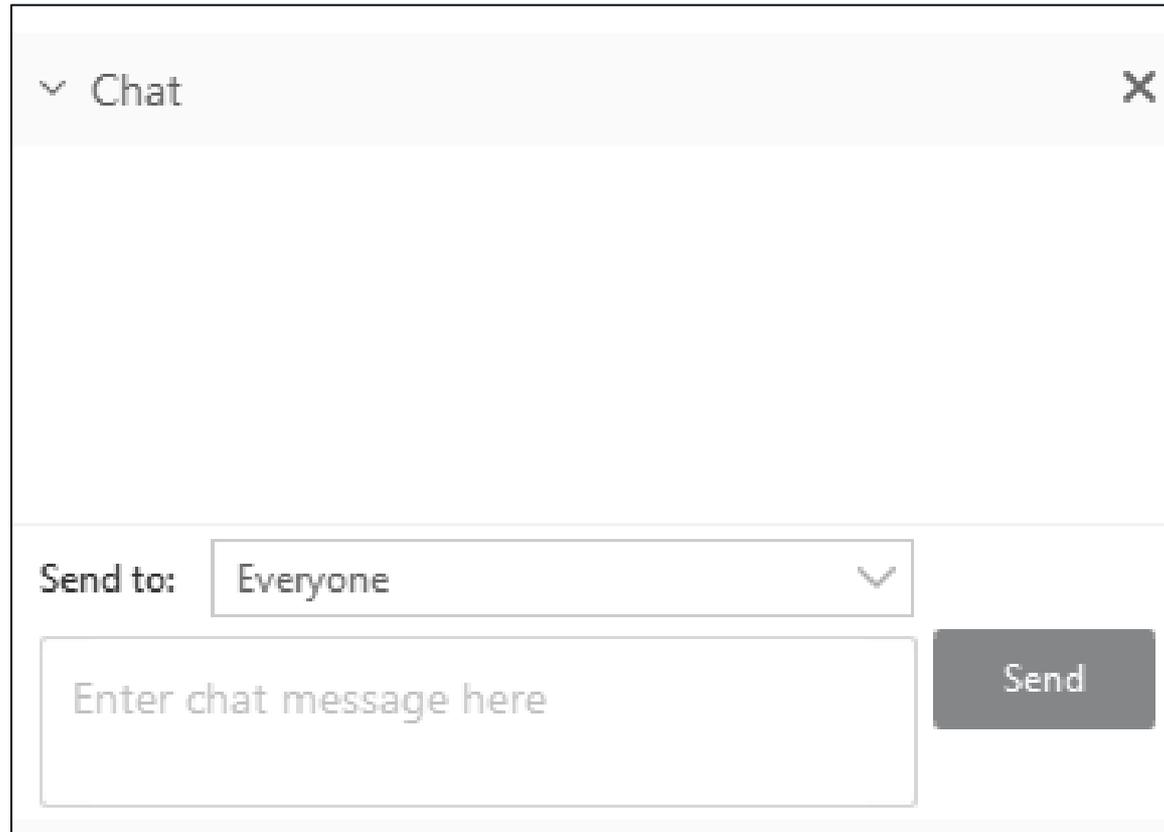
Fuel Cell Technologies Office Webinar

November 7, 2017



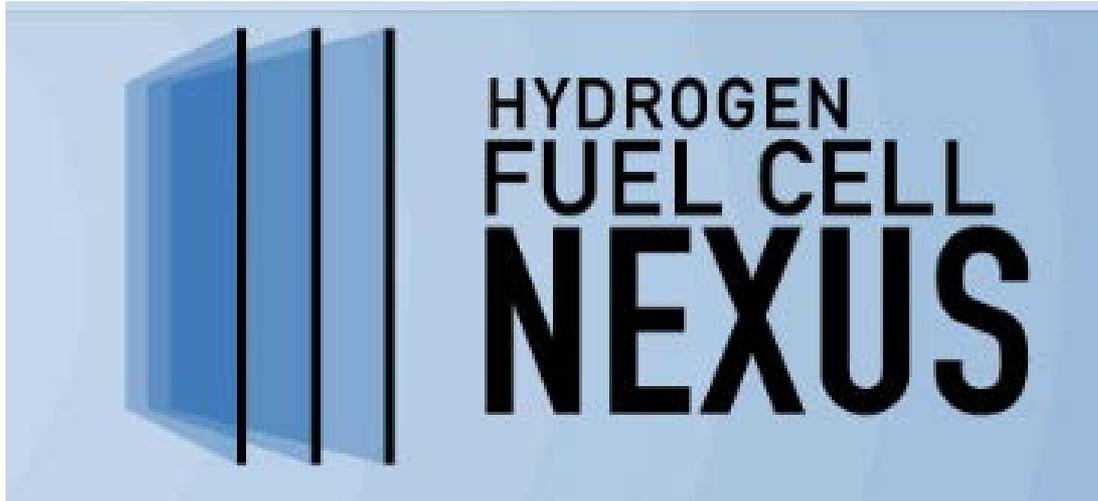
Question and Answer

- Please type your questions to the chat box. **Send to: (HOST)**



The image shows a chat window titled "Chat" with a close button (X) in the top right corner. Below the title bar is a large empty text area for messages. At the bottom of the window, there is a "Send to:" dropdown menu currently set to "Everyone". Below the dropdown is a text input field with the placeholder text "Enter chat message here". To the right of the input field is a dark grey "Send" button.

Hydrogen Fuel Cell Nexus Business Directory and Matchmaker



- What is the HFC Nexus?
- Features
- Matchmaker Function
- Call to Action



What is this Directory?

Hydrogen Fuel Cell Nexus is a business-to-business directory that helps suppliers connect with buyers.

Hydrogen Fuel Cell Nexus is a joint project of Virginia Clean Cities, Breakthrough Technologies Institute, and Birch Studio, and is funded by the Department of Energy's Fuel Cell Technologies Office.

With your help, we will make the US hydrogen and fuel cell supply chain be more robust, more efficient, and the most competitive in the world.

Home screen

Fueling clean transportation
Education, deployment and outreach www.fuelcellnexus.org

HYDROGEN FUEL CELL NEXUS
The US Hydrogen and Fuel Cell Directory

COMPANY TYPES | PRODUCTS | US MAP | MATCHMAKER

Hydrogen Fuel Cell Vehicle | Dispensing

Generation | Compression | Storage

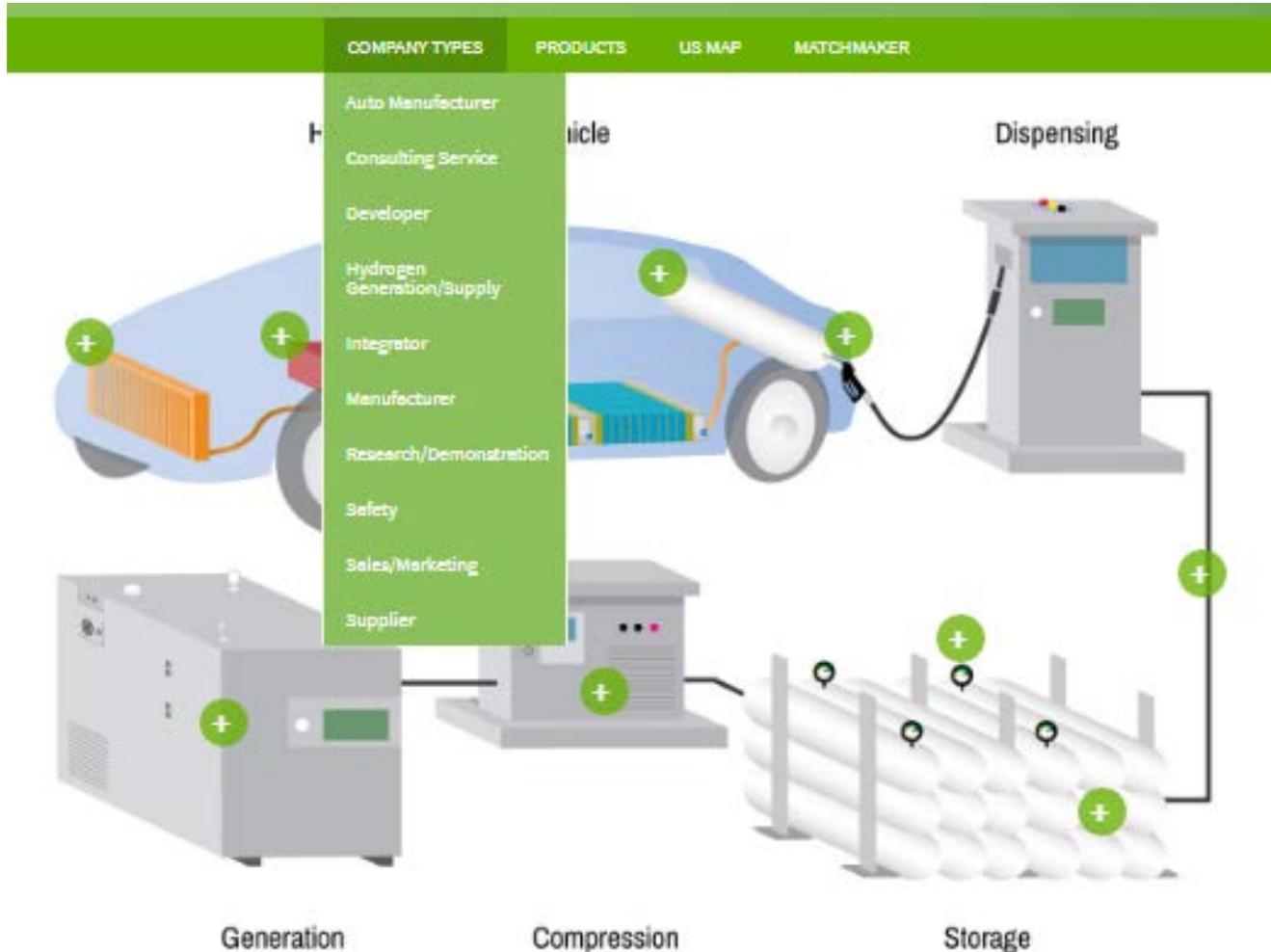
Hydrogen Fuel Cell Nexus is a business-to-business directory that helps suppliers connect with buyers. With your help, we will make the US hydrogen and fuel cell supply chain be more robust, more efficient and the most competitive in the world. **Sign up!**

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Fuel Cell Nexus is a joint project of Virginia Clean Cities, Breakthrough Technologies Institute and Birch Studio, and is funded by the Department of Energy's Fuel Cell Technologies Office.

Find a bug? Have a feature request? [Email us here.](#)

Search by Company Type



Images derived from and created by California Fuel Cell Partnership. Used with permission.

Search Results by Company Type

 National Hydrogen & Fuel Cell Day | 10-08

3rd Annual National Hydrogen and Fuel Cell Day
National Hydrogen and Fuel Cell Day was created to help raise awareness of a clean energy technology.

[Reverse]

HYDROGEN FUEL CELL NEXUS
The US Hydrogen and Fuel Cell Directory

Glossary | Resources | REGISTER | LOGIN

COMPANY TYPES | PRODUCTS | US MAP | MATCHMAKER

Search ...

INTEGRATOR

Companies that makes or assemble fuel cell systems

[Reverse]



Mac Satellite

Google

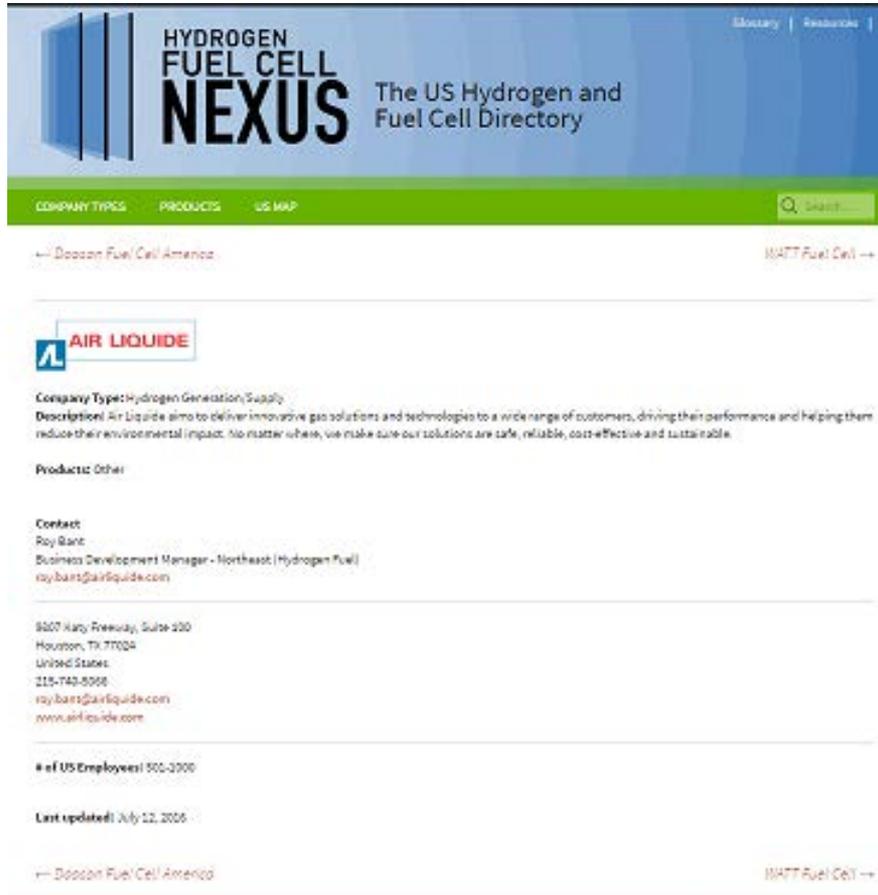
Air Liquide Houston, TX

Air Liquide aims to deliver innovative gas solutions and technologies to a wide range of customers, driving their performance and helping them reduce their environmental impact. No matter where, we make sure our solutions are safe, reliable, cost-effective and sustainable.

ALSO LISTED IN: Hydrogen Fuel, Hydrogen Generation/Supply, Hydrogen System Integrator

UPDATED: January 24, 2017

Company Page



HYDROGEN FUEL CELL NEXUS The US Hydrogen and Fuel Cell Directory

COMPANY TYPES PRODUCTS US MAP

← Boston Fuel Cell America →

AIR LIQUIDE

Company Type: Hydrogen Generation/Supply
Description: Air Liquide aims to deliver innovative gas solutions and technologies to a wide range of customers, driving their performance and helping them reduce their environmental impact. No matter where, we make sure our solutions are safe, reliable, cost-effective and sustainable.
Products: Other

Contact
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www.airliquide.com

of US Employees: 501-1000

Last updated: July 12, 2016

← Boston Fuel Cell America →



HYDROGEN FUEL CELL NEXUS The US Hydrogen and Fuel Cell Directory

COMPANY TYPES PRODUCTS US MAP MATCHMAKER

Glossary

Search ...



Company Type: Hydrogen Generation/Supply

Description: Air Liquide aims to deliver innovative gas solutions and technologies to a wide range of customers, driving their performance and helping them reduce their environmental impact. No matter where, we make sure our solutions are safe, reliable, cost-effective and sustainable.

Products: Hydrogen Fuel, Other

Fuel Cell Type: Alkaline Fuel Cell, Direct Methanol Fuel Cell, Metal/Air Fuel Cell, Molten Carbonate Fuel Cell, Phosphoric Acid Fuel Cell, Polymer Electrolyte Membrane Fuel Cell, Regenerative Fuel Cell, Solid Oxide Fuel Cell

Contact

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Business Development Manager - Northeast (Hydrogen Fuel)
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www.airliquide.com

of US Employees: 501-1000



Search by Product Type



Fueling clean transportation
Education, deployment and outreach www.vccleancities.org

[Advanced]

[Glossary](#) | [Resources](#) | [REGISTER](#) | [LOGIN](#)

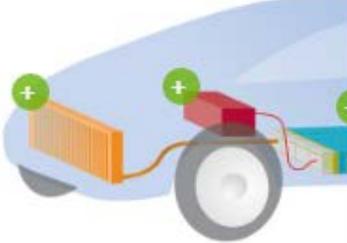


HYDROGEN FUEL CELL NEXUS

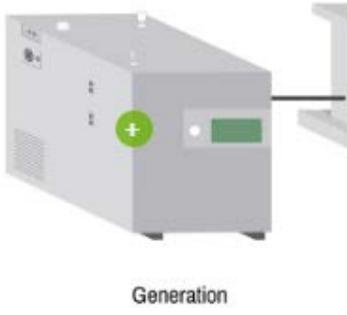
The US Hydrogen and Fuel Cell Directory

[COMPANY TYPES](#) | [PRODUCTS](#) | [US MAP](#) | [MATCHMAKER](#)

Hydrogen Fuel Cell



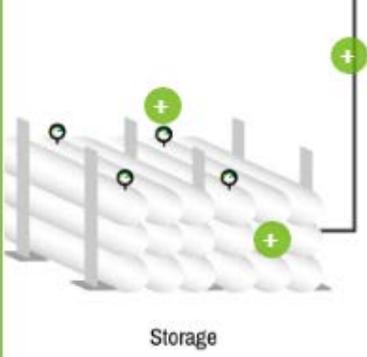
Generation



Dispensing



Storage



- Catalyst
- Compressor/Expander
- Electrodes
- Electrolyzer
- Gauges
- High Pressure Plumbing
- Hydrogen Pump/Ejector
- MEAs
- Nozzles
- Power Electronics
- Reactant Management
- Sensors
- Testing
- Thermal Management
- Vehicles
- Vessel Liner
- Vessel Manufacturing

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U.S. DEPARTMENT OF ENERGY

OFFICE OF ENERGY EFFICIENCY & RENEWABLE ENERGY

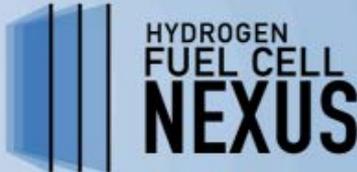
FUEL CELL TECHNOLOGIES OFFICE

9

Search Results by Product Type



Fueling clean transportation
Education, deployment and outreach www.vccleancities.org



HYDROGEN FUEL CELL NEXUS
The US Hydrogen and Fuel Cell Directory

[Glossary](#) | [Resources](#) | [REGISTER](#) | [LOGIN](#)

[COMPANY TYPES](#) | [PRODUCTS](#) | [US MAP](#) | [MATCH-MAKER](#)

Search

MEAS

The Membrane Electrode Assembly in a PEM fuel cell includes a polymer membrane, catalyst layers (anode and cathode), and gas diffusion.





3M Fuel Cell Components

Oskdale, MN

3M is a global supplier of components to the PEM fuel cell industry. 3M specializes in development and volume manufacture of durable, high performance, and consistent MEAs.

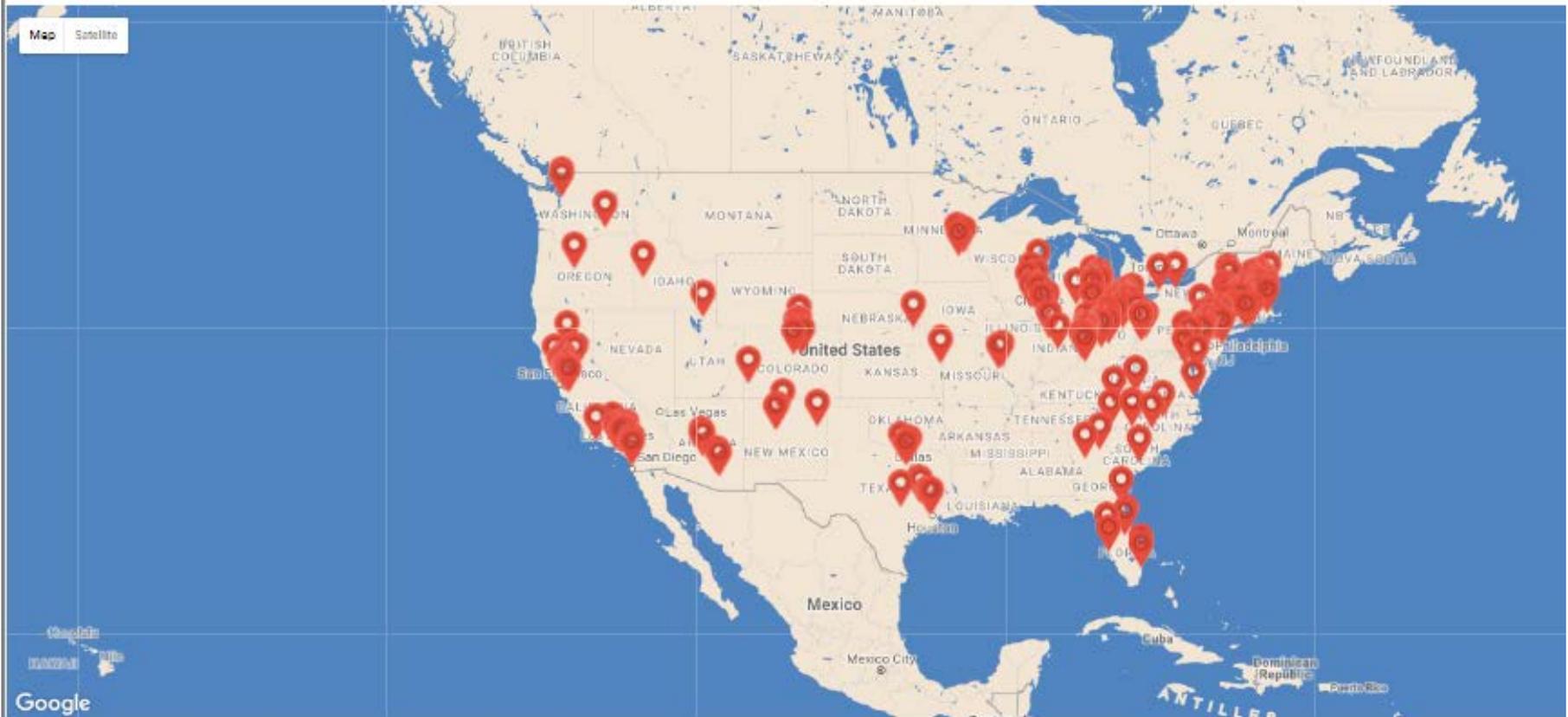
ALSO LISTED IN: Component Accessories, Diaphragms, Gas Diffusion Layers, Gaskets, Manufacturers, MEAs, Membranes, Plates,

Supplier
UPDATED: October 10, 2018

US Map of Headquarter Offices

Hydrogen and Fuel Cell Suppliers in the US

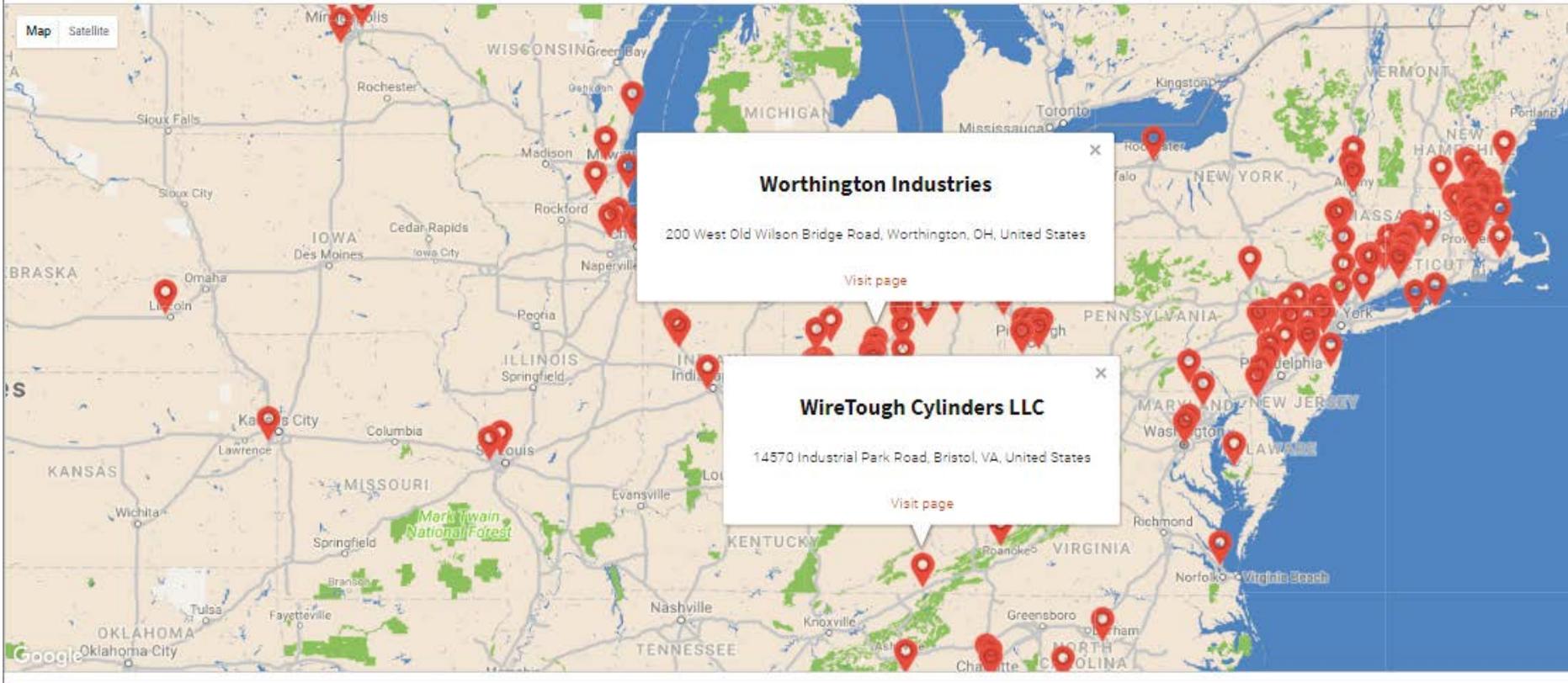
The map below shows the locations of organizations in the Hydrogen and Fuel Cell Database across the US. You can zoom in and click on pins to navigate.



Company Info in Map

Hydrogen and Fuel Cell Suppliers in the US

The map below shows the locations of organizations in the Hydrogen and Fuel Cell Database across the US. You can zoom in and click on pins to navigate.



Registration

[Home](#) | [Resources](#) | [Marketplace](#) | [REGISTER](#) | [LOGIN](#)

HYDROGEN FUEL CELL NEXUS

The US Hydrogen and Fuel Cell Directory

[COMPANY TYPES](#) | [PRODUCTS](#) | [US MAP](#) |

Register

Users can register themselves or you can manually create a user here.

Username *

First Name *

Last Name *

Email *

Password *

Strong passwords use upper and lower case letters, numbers and special characters like (!, # and %) and avoidable words. [Get Password](#) can help. (Maximum length of 8 characters)

Repeat Password *

Spam Prevention * I'm not a robot 

Matchmaker Function - Seeking

[Glossary](#) | [Resources](#) | [REGISTER](#) | [LOGIN](#)



HYDROGEN FUEL CELL NEXUS The US Hydrogen and Fuel Cell Directory

[COMPANY TYPES](#) | [PRODUCTS](#) | [US MAP](#) | [MATCHMAKER](#)

SEEKING

This page lists organizations that are seeking products, goods, services, etc in hydrogen and fuel cell markets.

X COMPANY

High-pressure valves

10,000 high-pressure valves by November 2016 or December 2016

Last updated: September 20, 2016



TRIPLE MEMBRANE CO

Heavy duty membranes with 2000 hour life cycle and high efficiency coefficient

12,000 membranes per month for the next year and the year after that.

Last updated: September 20, 2016

Matchmaker - Seeking

The screenshot displays the Hydrogen Fuel Cell Nexus Matchmaker interface. At the top, the logo for Hydrogen Fuel Cell Nexus is shown, along with the tagline 'The US Hydrogen and Fuel Cell Directory'. Navigation links for 'Glossary', 'Resources', 'REGISTER', and 'LOGIN' are visible in the top right. A green navigation bar contains 'COMPANY TYPES', 'PRODUCTS', 'US MAP', and 'MATCHMAKER', with a search bar on the right. Below this, a breadcrumb trail shows '← Seeking: Half-thick membranes' and 'Consulting →'. The main content area is titled 'Matchmaker' and includes a sub-header 'High-pressure valves'. The 'SEEKING' section states: 'I am seeking: 10,000 high-pressure valves by November 2016 or December 2016. Specifications: High-temp operation, plated, fancy-finish.' It also lists 'Fuel Cell Type: All' and 'Categories: High Pressure Plumbing'. The 'CONTACT' section provides: 'Company: X Company', 'Name: David Robinson', and 'My role is Sales'. An orange button labeled 'Reply to this Matchmaker Request' is positioned below the contact information. The breadcrumb trail is repeated at the bottom of the content area. The footer features the U.S. Department of Energy logo and text: 'U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy'. Below this, it states: 'Fuel Cell Nexus is a joint project of Virginia Clean Cities, Breakthrough Technologies Institute and Birch Studio, and is funded by the Department of Energy's Fuel Cell Technologies Office.' At the very bottom, a link reads: 'Find a bug? Have a feature request? Email us here.'

Matchmaker Function - Offering

The screenshot displays the Hydrogen Fuel Cell Nexus website. At the top, the logo features a stylized fuel cell stack icon next to the text 'HYDROGEN FUEL CELL NEXUS' and 'The US Hydrogen and Fuel Cell Directory'. Navigation links for 'Glossary', 'Resources', 'REGISTER', and 'LOGIN' are in the top right. A green navigation bar contains 'COMPANY TYPES', 'PRODUCTS', 'US MAP', and 'MATCHMAKER', along with a search box. The 'OFFERING' section is highlighted, with a sub-header 'HYDROGEN PROS CONSULTING' and the title 'Consulting'. The description reads: 'Advice on how to integrate various pieces, parts, software, grid tie-ins, policy and operational elements of fuel-cell and hydrogen related activities.' The last update is 'September 21, 2016'. Below this is another offering titled 'TEST WAREHOUSE TESTER' with the title 'Warehouse space', description 'I have 12,000 feet of warehouse space and fulfillment', and last update 'September 20, 2016'. The footer includes the U.S. Department of Energy logo and text: 'U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy' and 'Fuel Cell Nexus is a joint project of Virginia Clean Cities, Breakthrough Technologies Institute and Birch Studio, and is funded by the Department of Energy's Fuel Cell Technologies Office.'

Matchmaker - Offering

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Matchmaker
The information below was submitted to Hydrogen Fuel Cell Nexus in search of a match.

Warehouse space

OFFERING
I am offering: I have 12,000 feet of warehouse space and fulfillment
Capabilities: We can fulfill orders for you, or provide access to our secure facility.
Can produce custom orders: No

Fuel Cell Types: Other
Categories: Compressor/Expander

CONTACT
Company: Test Warehouse Tester
Names: David Robinson
My role is: Distribution

[Reply to this Matchmaker Request](#)

← Seeking: 1000 Blower Fans Needed Seeking: Micro-thin membranes →

Creating a Matchmaker Post

The screenshot shows a web application interface for creating a Matchmaker post. On the left is a dark sidebar with navigation items: Dashboard, Organizations, Matchmaker (highlighted), All Matchmakers, Add New, Media, Pages, Comments, Appearance, Plugins, Users, Profile Builder, Permissions, Tools, Settings, Custom Fields, Notifications, Security, Social Security, All Export, All Import, and Collapse menu.

The main content area has a header with a text input field labeled "Enter title here". Below this is a welcome message: "Welcome to the HFCeZone Matchmaker. The forms below will help us to help you, and help create a stronger supply chain at the same time. Please click the blue Submit for Review (or Update) button in the right column to submit the Matchmaker request. After you submit, we will review your post and process accordingly. You can edit it again any time you wish." A green banner with the word "MATCHMAKER" is displayed.

The form contains several sections:

- Post Title ***: A text input field with the instruction "Give your Matchmaker request a title."
- Seeking or Offering? ***: Radio buttons for "Seeking" (selected) and "Offering".
- Enter how much you need, of what, by when ***: A large text area.
- Please provide the specifications that you require ***: A large text area.
- Fuel Cell Type ***: Radio buttons for "PEMFC", "SOFC", "All", and "Other". The instruction is "For the purposes of this post, which fuel cell type(s) do you work with?"

On the right side, there is a "Publish" panel with buttons for "Save Draft", "Preview", "Status: Draft Edit Customize", "Visibility: Public Edit", "Publish immediately Edit", and a large blue "Publish" button.

Creating a Matchmaker Post

Matchmaker

Fuel Cell Type *
For the purposes of this post, which fuel cell type(s) do you work with?

H2/OFC SOFC All Other

Relevant Categories
For things you couldn't find in the dropdown...

Catalyst Compressor/Expander Electronics Electrolyzer Oxygen High Pressure Flowing Hydrogen Pump/Ejector MEAs Power Electronics Fuel Air Management Fuelizer Sevens Testing Thermal Management

Vehicle Naval Line Naval Modernization Other

GENERAL INFO

First Name *

Last Name *

Company

Logo
700 files with no background color work best. JPG and GIF files are acceptable.

No image selected [Add Image](#)

Phone *

Email *

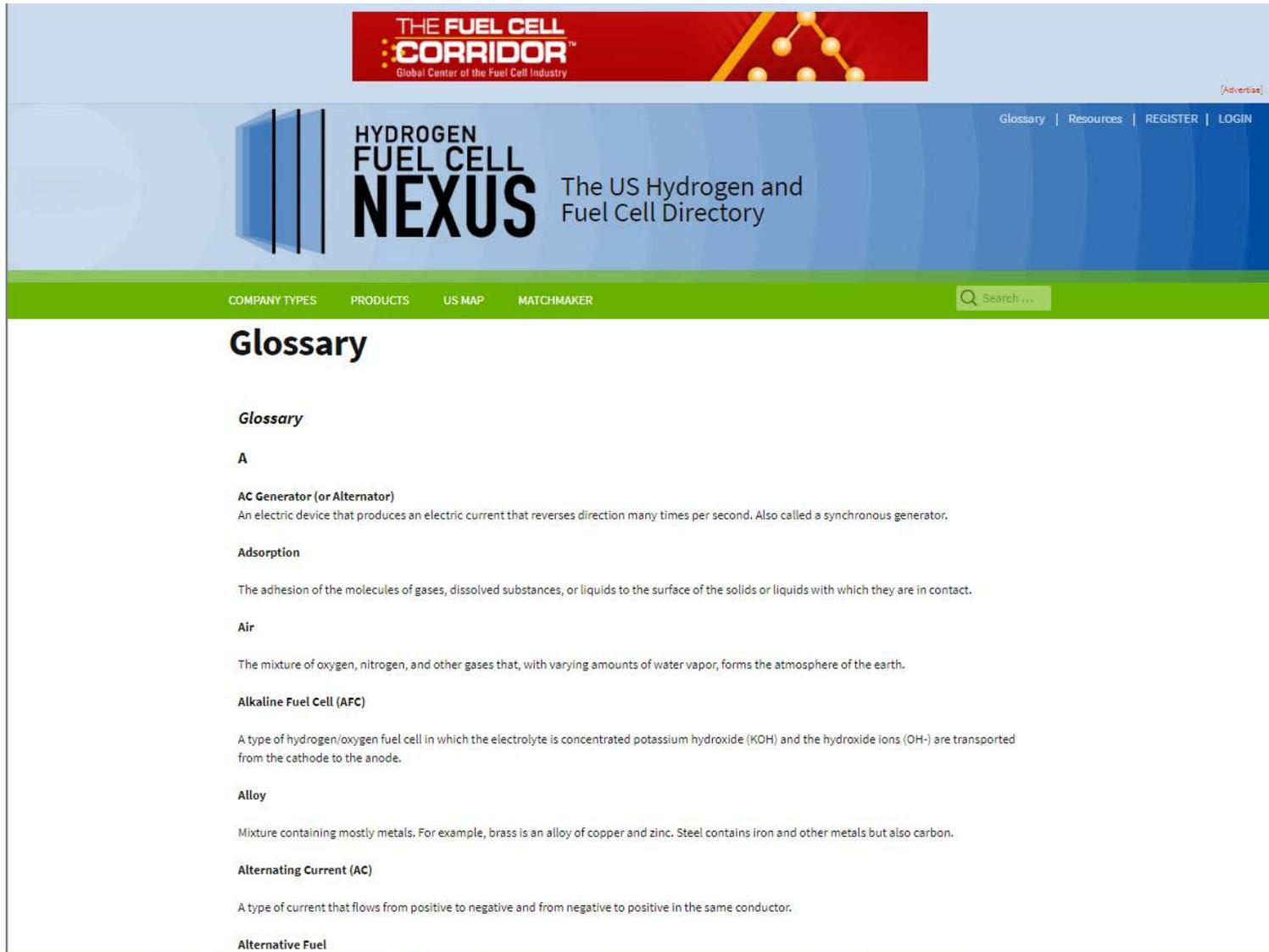
My role is *

Distribution Executive Finance Manufacturing Policy Procurement Project Management Research Sales Testing Other

LinkedIn Profile

DATA SHARING

Submitting Data *



The screenshot shows the top navigation bar of the Hydrogen Fuel Cell Nexus website. It includes a red banner for 'THE FUEL CELL CORRIDOR™' with the tagline 'Global Center of the Fuel Cell Industry'. The main header features the 'HYDROGEN FUEL CELL NEXUS' logo and the text 'The US Hydrogen and Fuel Cell Directory'. Navigation links for 'Glossary', 'Resources', 'REGISTER', and 'LOGIN' are visible. A green navigation bar contains 'COMPANY TYPES', 'PRODUCTS', 'US MAP', and 'MATCHMAKER', along with a search bar. The main content area is titled 'Glossary' and lists definitions for 'AC Generator (or Alternator)', 'Adsorption', 'Air', 'Alkaline Fuel Cell (AFC)', 'Alloy', 'Alternating Current (AC)', and 'Alternative Fuel'.

THE FUEL CELL CORRIDOR™
Global Center of the Fuel Cell Industry

[Advertise]

Glossary | Resources | REGISTER | LOGIN

HYDROGEN FUEL CELL NEXUS The US Hydrogen and Fuel Cell Directory

COMPANY TYPES PRODUCTS US MAP MATCHMAKER Search ...

Glossary

Glossary

A

AC Generator (or Alternator)
An electric device that produces an electric current that reverses direction many times per second. Also called a synchronous generator.

Adsorption
The adhesion of the molecules of gases, dissolved substances, or liquids to the surface of the solids or liquids with which they are in contact.

Air
The mixture of oxygen, nitrogen, and other gases that, with varying amounts of water vapor, forms the atmosphere of the earth.

Alkaline Fuel Cell (AFC)
A type of hydrogen/oxygen fuel cell in which the electrolyte is concentrated potassium hydroxide (KOH) and the hydroxide ions (OH⁻) are transported from the cathode to the anode.

Alloy
Mixture containing mostly metals. For example, brass is an alloy of copper and zinc. Steel contains iron and other metals but also carbon.

Alternating Current (AC)
A type of current that flows from positive to negative and from negative to positive in the same conductor.

Alternative Fuel

COMPANY TYPES PRODUCTS US MAP MATCHMAKER

Resources

Department of Energy Fuel Cells Technology Office

The Fuel Cell Technologies Office covers a comprehensive portfolio of activities that address the full range of barriers facing the development and deployment of hydrogen and fuel cells with the ultimate goals of decreasing our dependence on oil, reducing carbon emissions, and enabling clean, reliable power generation.

Department of Energy Market Analysis Reports

Annual reports about fuel cell and hydrogen technology market analysis are provided by the Department of Energy.

National Renewable Energy Laboratory Hydrogen & Fuel Cell Research

Staff contacts for NREL's Hydrogen and Fuel Cell Research program.

Account Registration Tutorial Video



Call to Action

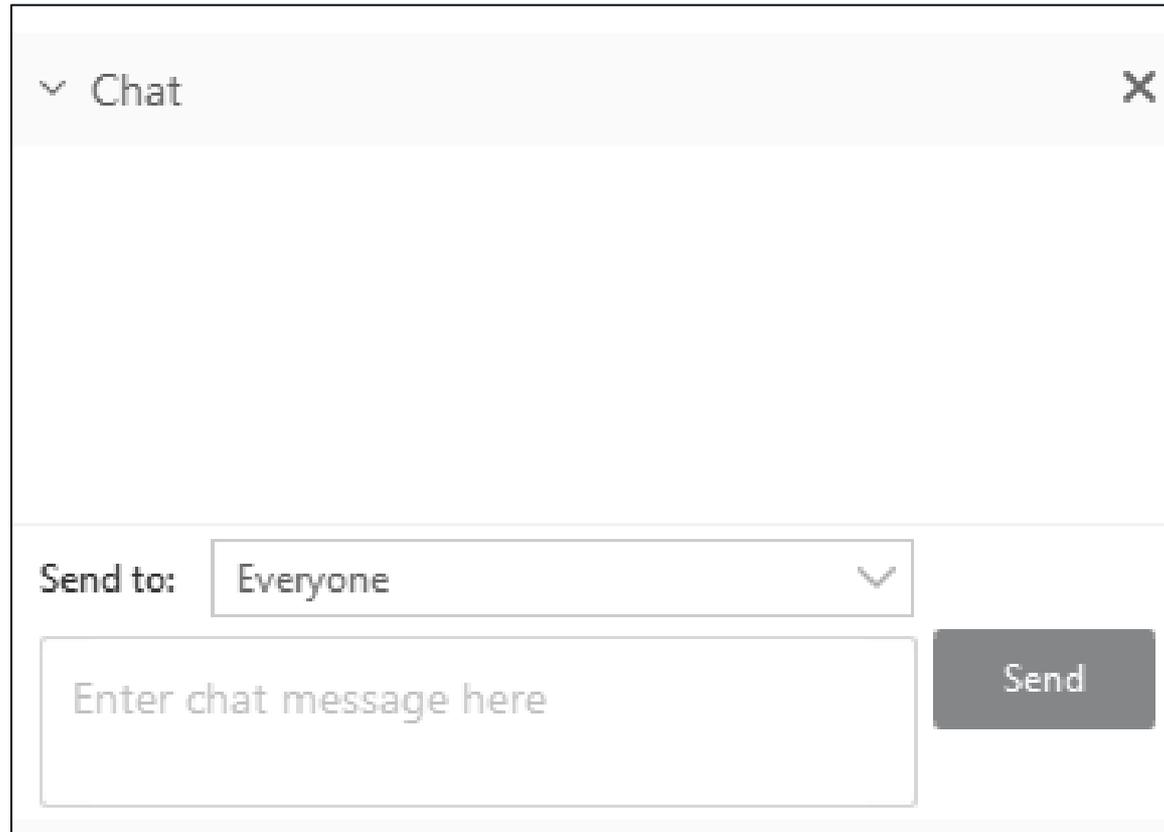
- Use the website
 - Information resource
 - Business directory
 - Product marketing arena
 - Customer facing platform
- Send additional business contacts and product updates
- Advertise and Support the website
 - \$4,000 per year for Leaderboards (Limit 10)
 - \$3,000 per year for Category advertisements (Limit 4 per category)

Alleyn Harned 540-568-8896 admin@hfcnexus.com

The financial support of the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Fuel Cell Technologies Office (Cooperative Agreement no. DE-EE0006932) is gratefully acknowledged. The competitively-selected project is supported with FY 2015 funding.

Question and Answer

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Thank you

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