

Co-Creating the “Connected Future” with CubiTan®

Bring a Better Life with Smart Digital Gas Network



atomis



YACHIYO
Engineering

Innovation

Large and heavy high-pressure gas containers can be converted into small, compact, and lightweight containers.



90%
reduction in size

75%
reduction in weight



CubiTan[®]

Next-generation smart high-pressure gas container controls gases at the nano-level using "Metal-Organic Framework (MOF)" as a gas adsorbent.

12kg, 30cm x 30cm x 36cm

Compresses gas to a volume that fits into a conventional high-pressure gas cylinder. MOF has a huge surface area of more than one soccer court per gram.

1, 2. & 3.

Transportable & Stackable

Cube-shaped frame is not only easily transportable but also stackable for storage

4.

IoT device equipped

IoT modules such as GPS, gas meter, temperature, and Wi-Fi are included to visualize remote inventory control and gas leak management

5.

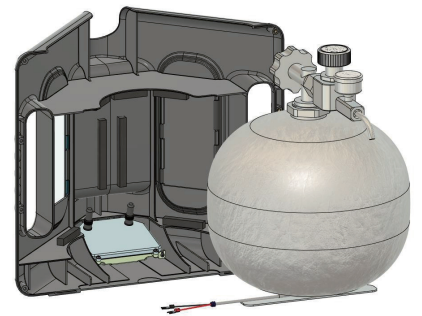
1.



2.



3.



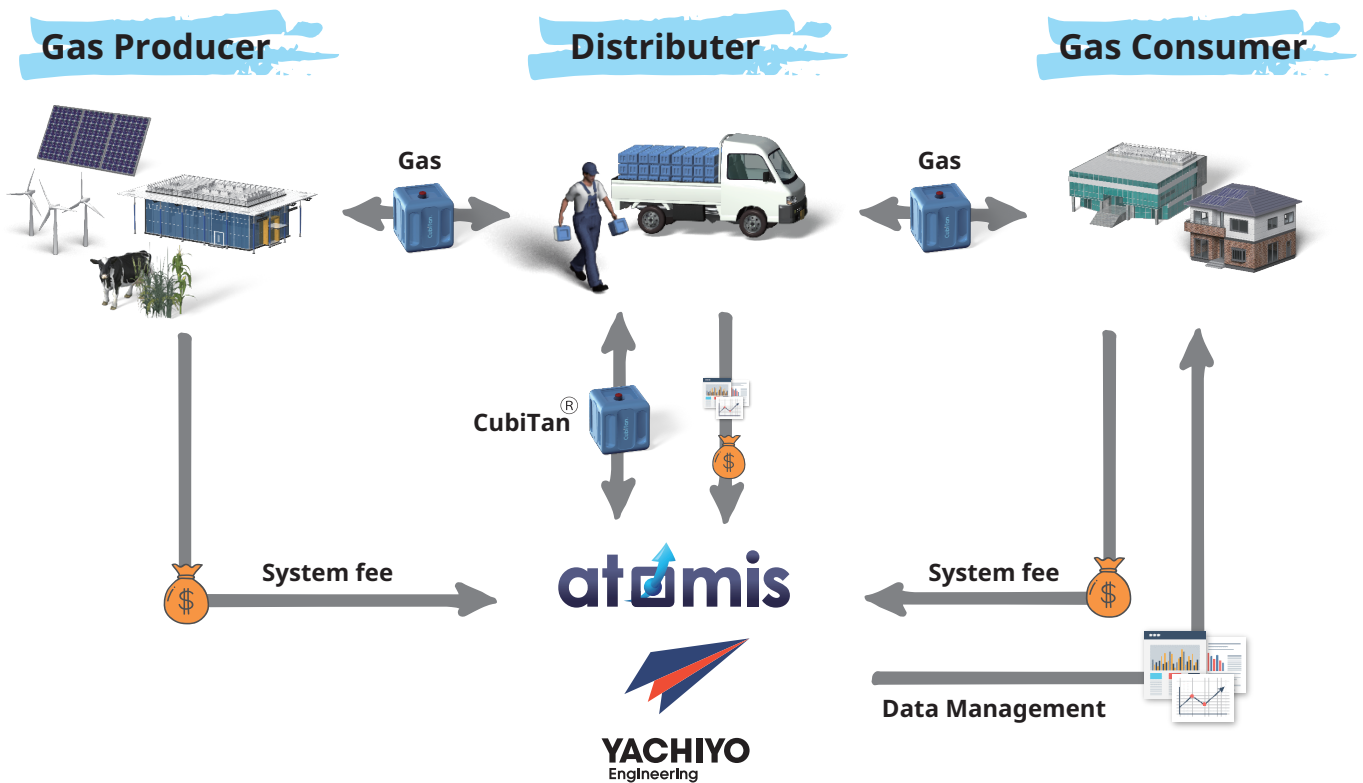
4.



5.

Change the Society

Change an industry that hasn't changed in 100 years. The goal is to build a smart grid of gas infrastructure using CubiTan[®]. Atomis and Yachiyo Engineering supply CubiTan[®] to the market and build a new gas distribution system.



Key Concept | Bring a Better Life with Smart Digital Gas Network

Design New Daily Life

Improvement of usability and safety with smaller and lighter gas storage device, CubiTan[®].



Change the Value Chain

Creating a Social Gas Energy Management Framework which generates, distributes and monitors a gas in smarter way.



Achieve Carbon Neutral

Contribute to reduce CO₂ emissions by bio-gas generation and optimum gas distribution.

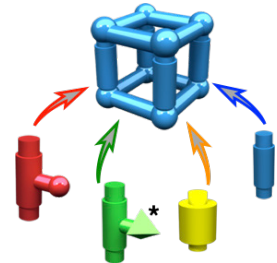


Material

Metal-Organic framework (MOF) consist of metal ions and organic ligands that form porous, three-dimensional crystalline structures.

Large Surface Area & Designability

MOF is also called an porous coordination polymer (PCP), in which the metal and the organic compound have regularity and continuously form a three-dimensional structure, and the porosity controlled at the nano level is achieved. It has the feature that the pore space can be freely designed by selecting metal and organic ligands.

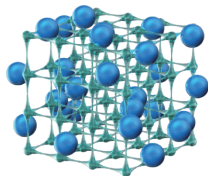


Multifunction

Using aligned pores of MOF, research on new functions such as ion transport, electron conduction, electromagnetic properties, and photoexcitation as well as molecular adsorption, separation, transport, alignment, synthesis, and catalysis can be conducted. It is being considered not only in the energy and environmental solutions industry but also in a wide range of industries such as food, pharmaceuticals, electronic components, electrical equipment, building materials, chemistry, semiconductors, and space development, and is expected to have a major impact on the industrial field.

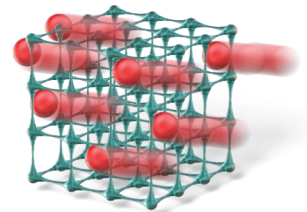
Storage

Gas storage
Heat Pumps
Drug delivery
Aroma control



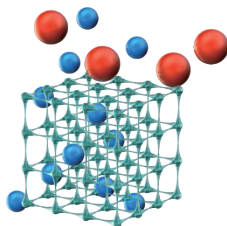
Ion transport/ Conductivity

Li ion batteries
New capacitors
Fuel cells



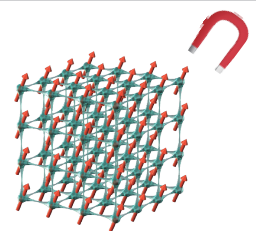
Separation

CO2 separation
Sulfur removal
Toxic gas removal
Desalination



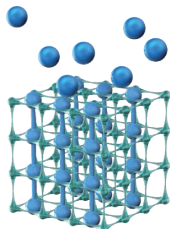
Magnetic/ Electronic properties

Sensing elements
Efficient separations
Molecular localization



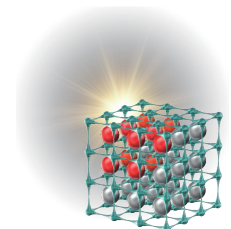
Polymerization

Linear polymers
High-density polymers



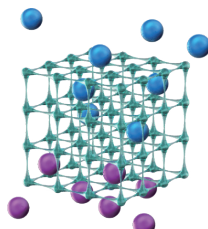
Optical properties

Fluorescent elements
Solar battery materials
Cancer therapeutics



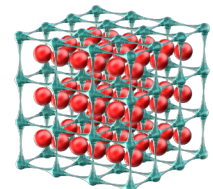
Catalysis

CO2 reduction
Alcohol oxidation
Catalyst composites



Molecular alignment

New semiconductors
Molecular motors



Company Profile

Atomis Inc.

We provide innovative global solutions for precisely controlling gases.

Although humankind has become proficient at manipulating solids and liquids, the ability for gases to diffuse instantly makes them extremely difficult to fully control.

We can precisely control gases by using the nanoscale cages of porous coordination polymer/metal-organic framework (PCP/MOF) to spatially confine the gas molecules. These porous solids were discovered by Distinguished Professor Susumu Kitagawa at the Institute for Advanced Study at Kyoto University, and our mission is to contribute to the creation of new value using these cutting-edge materials.



Founder & Advisor

Masakazu Higuchi, PhD
(Assistant Prof. of Kyoto University Institute for Advanced Study)

President & CEO

Daisuke Asari

Director & COO

Dai Kataoka

Executive Officer & CSO

Kenji Sumida, PhD

Scientific Advisor

Susumu Kitagawa, PhD

(Distinguished Prof. of Kyoto University Institute for Advanced Study)

Takashi Uemura, PhD

(Prof. of The University of Tokyo)

Hisashi Kashima

(Prof. of Kyoto University Graduate School of Informatics)

Foundation

February 10, 2015

Number of Employees (as of July 2023)

23

Capital

2,032,195,000 JPY (including the capital reserve)

Business

The first startup in Japan specializing in Porous Coordination Polymer/ Metal-Organic Framework.

Company Profile

Yachiyo Engineering Co., Ltd.

Innovative solutions for the society

The change in the environment means a change in values. From population increase to global environmental issues, new values for conservation/preservation were created, as well as bringing to light new social issues. What is required now is to face these combined issues and proactively create new ways in addressing them, which is a difficult task yet a worthy challenge.

Beyond our expertise of engineering consultancy, our unique strengths rest in our vast stock of accumulated technologies and knowledge, unprecedented and original problem-solving strategies and ideas, and a noble vision that shall lead us into the next millennium.

All members of the company wish to march forward to sincerely face and support those who wish for a brighter future, enabling us to further innovate solutions for society. We at Yachiyo Engineering Co., Ltd. rise up to the challenge of realizing and creating what the next millennium could become.



YACHIYO
Engineering

Chairman

Shigemitsu Demizu

President

Tsutomu Takahashi

Foundation

January 29, 1963

Capital

JPY 450 million

Amount of Contracts (as of July 2022)

JPY 24.93 billion

Number of Employees (as of July 2022)

1,211 (993 Professional Staff + 218 Administrative Staff)

Business

Consulting engineering services in the following fields:
Urban Planning, Private Sector Development, Architecture, Solid Waste Management, Water Supply, Wastewater, Water Resources Management, Roads and Bridges, Railway, Transport Planning, Electricity and Power, Renewable Energy, Broadcasting, Information and Communication Technology.



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