STANDARD PACKAGE DIVISION

Light Chemical Applications

106 **Worldwide network offices**
(in **45** countries overseas)

4737 **Employees**
(**2473** in Japan & **2264** Oversea)

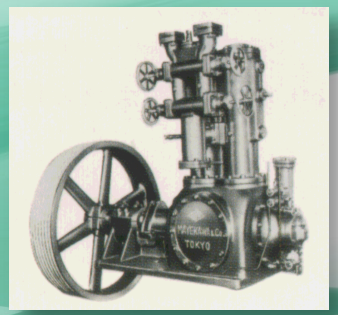
11 **Factories**
(**3** in Japan & **8** Oversea)

London
Paris
Madrid
Hamburg
Brussels
Muenchen
Zug
Milan
Bologna
Poznan
Sofia
Istanbul
Moscow
Cairo
Abu-Dhabi
Dubai
New Delhi
Beijing
Dailan
Seoul
Busan
Qingdao
Shanghai
Guangzhou
Taipei
Taichung
Kaohsiung
Bangkok
Manila
Trang
Ho Chi Min City

Singapore
Changwon
Jakarta
Surabaya
Moriya
Saku
Tokyo
Higashihiroshima
Kuala Lumpur
General Santos
Kuala
Cape Town
Sydney
Auchland
Vancouver
Seattle
Calgary
Toronto
Chicago
Nashville
New York
York
Covina
San Antonio
Houston
Hermosillo
Culiacan
Monterrey
Irapuato
Guadalajara
Mexico City

Medan
Cuernavaca
Villahermosa
San Josè
Medellin
Maracaibo
Barcelona
Bogota
Caracas Maracay
Guayaquil
Lima
Curaba
Recife
Goiania
Bahia
Macae
Oeste Paulista
Rio de Janeiro
Aruya
Curitiba
Chapeco
Santiago
Concepcion
Rio grande do Sul
Buenos Aires
Puerto Montt
Puerto Madryn

HISTORY OF MAYEKAWA GROUP

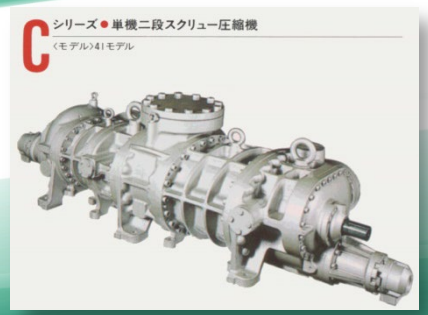


First Reciprocating Compressor

1924

Multiple Cylinder Reciprocating Compressor

1958



Screw Compressor

1960

Ethylene Plant

1970

4K Super Low Temp. Particle Accelerator

1978

LNG Tanker

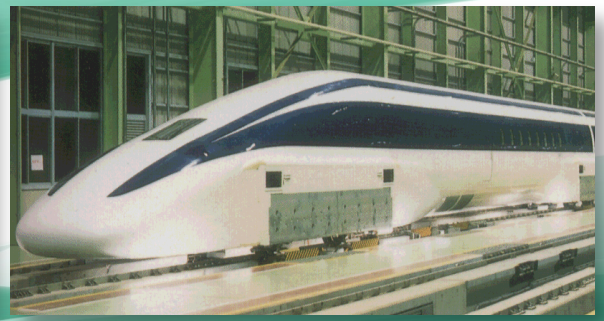
1980

- Company founded in 1924.
- Over 90,000 screw and reciprocating compressors running in more than 100 countries.
- 40% of the world market share.

HISTORY OF MAYEKAWA GROUP

Nuclear Fusion

1981



MagLev Train

1984

Rocket Fuel

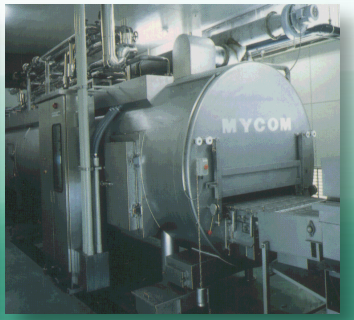
1989

Chemical Plant
(EG & NH_3)

1990

Super GE
(Super Conductive
Electric Generator)

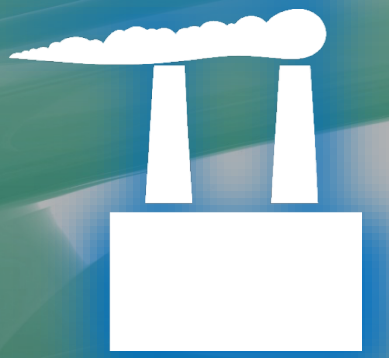
1993



Pharmaceutical

2000

- Company founded in 1924.
- Over 90,000 screw and reciprocating compressors running in more than 100 countries.
- 40% of the world market share.

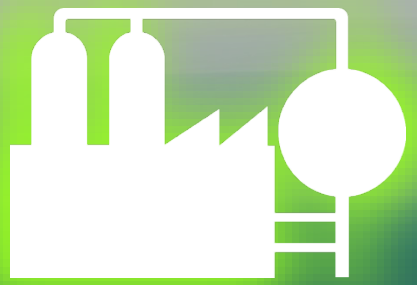


Refinery

Mining

Refrigeration

Power



Biogas

Oil&Gas

Chemical

CO_2 recovery and liquefaction

Marine

Bio-Fuel

APPLICATIONS

Gas Processing Plants

- Dew point control
- Cryo plant refrigeration
- Deethanizer plant refrigeration
- Chemical & Petrochemical

Fertilizer Plants

- Ammonia storage
- Loading & unloading refrigeration
- Boil-off gas (BOG) compression

Plants and Refineries

- Water/glycol chilling
- Heat transfer fluid (HTF) chilling
- Chlorine liquefaction
- Hydrocarbon refining

Hydrocarbon Storage Facilities

- Propane & butane storage
- Loading & unloading refrigeration
- BOG compression

APPLICATIONS

Liquefied Natural Gas (LNG) Plants

- BOG condensing units
- Gas turbine inlet air chilling
- Turbine fuel gas compression

Power Generation Plants

- Gas turbine inlet air chilling
- Turbine fuel gas compression

Pharmaceutical Facilities

- Water/glycol chilling
- HTF chilling
- Low-temperature refrigeration

Environmental Systems

- Environmental test chambers
- Flare gas recovery
- CO_2 compression & liquefaction
- Carbon sequestration & EOR
- Vapor recovery units

APPLICATIONS

Offshore Production, Storage and Offloading Facilities

- Mixed hydrocarbon compression
- Process gas chilling
- BOG compression

Biogas and Landfill Gas Applications

- Process gas compression
- Mixed hydrocarbon compression
- Hydrogen and sour gas
- CO_2 compression & liquefaction

Industrial Gas Applications

- Process gas chilling & condensing
- Nitrogen chilling
- Air chilling

Hydrogen has been identified as a key element for the decarbonization of different sectors:

- Energy
- Mobility
- Industry
- Residential

OUR CHALLENGE

A lot of investments in decarbonization of the Planet and in green technology where our standard compressor unit can be used:

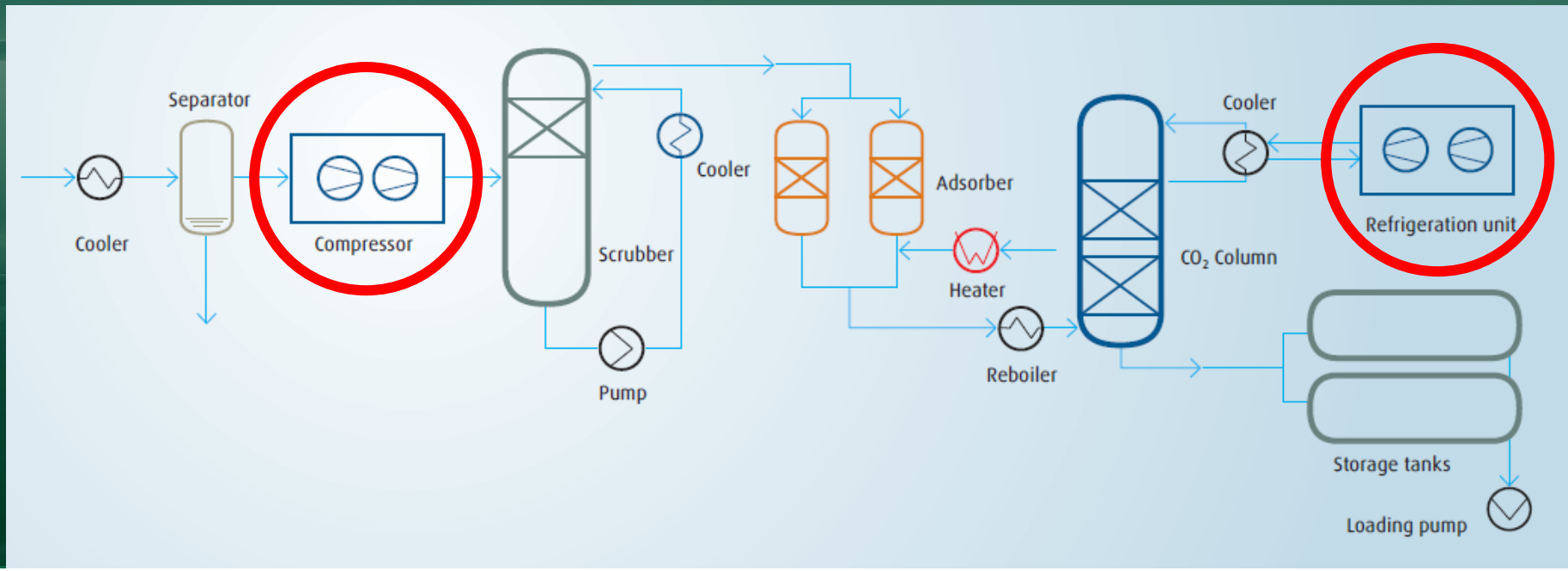
- **Biogas upgrading plants**
- **Power Purchase Agreement (PPA)**
- **Hydrogen production plants**
- **CO_2 liquefaction plant**
- **CO_2 recovery system (CCS)**

CO_2 LIQUEFACTION AND PURIFICATION APPLICATIONS

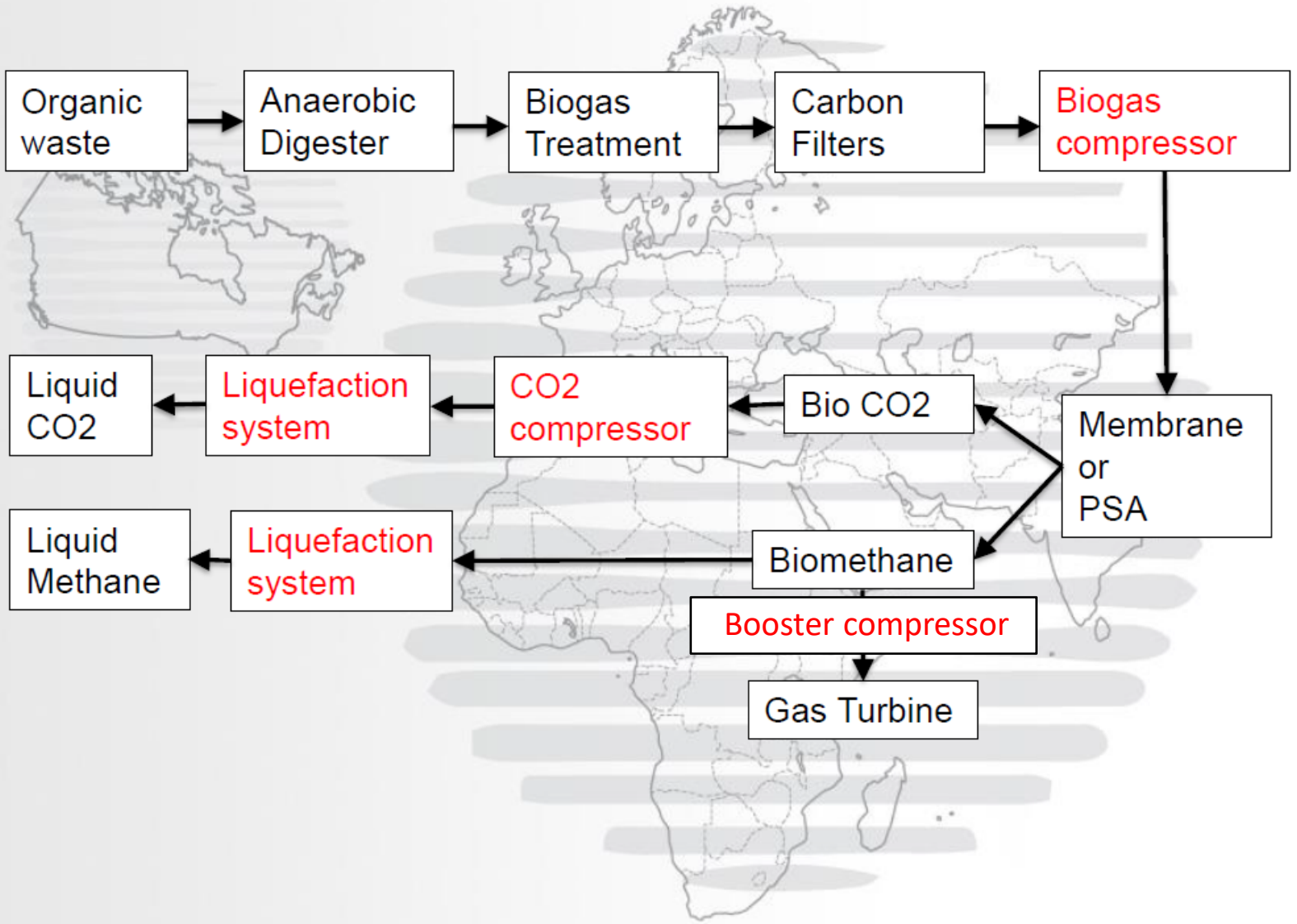
Our compression units support :

- **Ammonia**
- **Ethylene oxide/glycol**
- **(Bio) Ethanol**
- **Natural wells**
- **Refineries**
- **Synthesis gas**
- **Biogas**
- **Natural gas sweetening processes**

- Step-by-step process flow pre-cooling and compression.
- This unit cools down the water-saturated feed gas and then separates the water.
- The cooled gas is sent to the CO_2 compressor to increase the pressure up to operating conditions. Boil-off gas from the storage tanks can also be recycled to the compressor.
- Oil filters and various adsorbers can be added downstream as required to remove additional components such as hydrogen sulfide (H_2S).
- Mayekawa can supply the CO_2 compressor and NH_3 compressor unit.



BIOGAS PROCESS



WHAT WE CAN DO

- Biogas compressor unit
- CO_2 compressor unit
- MR compressor unit
- Chiller
- Booster compressor

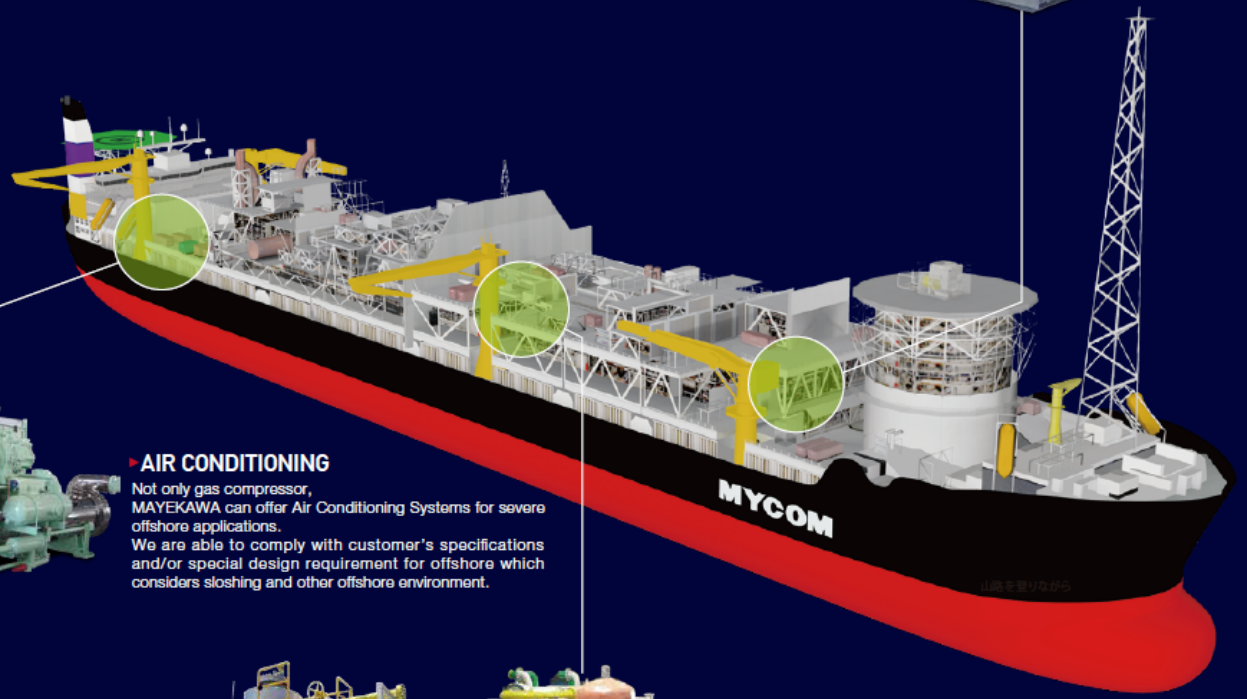
MAYEKAWA'S AVAILABLE APPLICATIONS

- Process Gas Compression
- Vapor Recovery
- Refrigeration
- Air Conditioning (HVAC)
- Fuel Gas Boosting
- Wellhead & Gas Gathering
- Gas Turbine Inlet Air Cooling

and more ...

VAPOR RECOVERY

By recent environmental circumstance, needs of Flare Gas Recovery and/or other gas recovering systems are increasing.
Our flare recovery systems are currently operating on oil rigs around the world.
Also our own developed compressor technology with isolated lubrication systems allows you to recover gases such as heavier hydrocarbon gases or gas including active substances. This unique system offers you advantage of both dry and wet screw design.



AIR CONDITIONING

Not only gas compressor,
MAYEKAWA can offer Air Conditioning Systems for severe offshore applications.
We are able to comply with customer's specifications and/or special design requirement for offshore which considers sloshing and other offshore environment.

REFRIGERATION

Mayekawa's outstanding refrigeration technology and experience will offer you reliable cooling for various gases.
Moreover our latest technology allows using a variety of natural refrigerants, which could be the key solution to global environmental problems.

※This FPSO image is for illustrative purposes.

OUR RELIABILITY

Mayekawa's well sophisticated Compressor Package Design and High Quality provide "HIGH RELIABILITY"

MYCOM OFFSHORE
SCREW COMPRESSOR PACKAGE
IN FOULING SERVICE

Platform	2014	Running Hour Interval before Overhaul as of End of 2014
A	97,84%	>98303
B	98,60%	>52325
C	99,53%	>29302
D	99,40%	>27988
E	98,50%	>35748
F	98,20%	>25253
G	99,30%	>20253

Source: Real Data / Information from End-User

98.7% as Whole package
*as average of above Real Data

FOR REFERENCE
"GENERAL BARE SHAFT COMPRESSOR"

Equipment	Availability	
	Highest	Average
Rotary Screw (Oil-Injected)	99.2%	97.7%
Rotary Screw (Dry Type)	99.6%	99.0%
Centrifugal (Clean service)	99.9%	99.7%
Centrifugal (Fouling service)	99.6%	99.0%
Reciprocating (Oil-Injected)	99.5%	97.3%
Reciprocating (Dry Type)	98.6%	91.3%

Source: Jan.'99 – Hydrocarbon Processing Magazine

Reliability of bare shaft screw compressor is generally known as 97.7 % (as average)

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