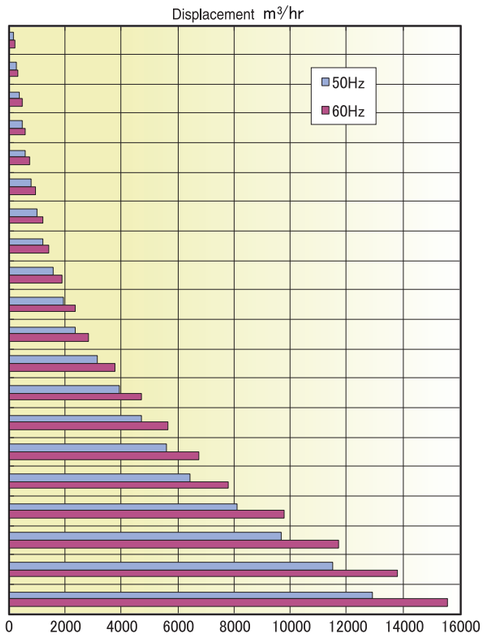
Screw compressor

Model		Frequency	Rotating speed	Displacement
Single stage	Two stage compound type	Hz	rpm	m³/hr
125S	–	50 / 60	2950 / 3550	196 / 237
125L		50 / 60	2950 / 3550	295 / 355
160S	1612C	50 / 60	2950 / 3550	414 / 499
160M		50 / 60	2950 / 3550	518 / 620
160L		50 / 60	2950 / 3550	622 / 744
200S	2016C	50 / 60	2950 / 3550	810 / 969
200M		50 / 60	2950 / 3550	1010 / 1215
200L		50 / 60	2950 / 3550	1210 / 1450
250S	2520C	50 / 60	2950 / 3550	1570 / 1880
250M		50 / 60	2950 / 3550	1980 / 2370
250L		50 / 60	2950 / 3550	2360 / 2830
320S	3225C	50 / 60	2950 / 3550	3170 / 3790
320M		50 / 60	2950 / 3550	3950 / 4730
320L		50 / 60	2950 / 3550	4730 / 5660
320LL		50 / 60	2950 / 3550	5600 / 6740
400S	4032C	50 / 60	2950 / 3550	6460 / 7780
400M		50 / 60	2950 / 3550	8120 / 9760
400L		50 / 60	2950 / 3550	9700 / 11700
400LL		50 / 60	2950 / 3550	11500 / 13800
400XL		50 / 60	2950 / 3550	12900 / 15600

Displacement means theoretical displacement.



Please indicate items below for inquiry.

1	Name of end-user and the plant name				
2	Purpose of use				
3	Applicable laws and standards				
4	Location (country, place, in/outdoor, non/hazardous category, etc.)				
5	Ambient temperature (max/min)				
6	Type of driver required (motor, gas engine etc.)				
7	Required conditions		Case 1 (normal)	Case 2	Case 3
-1	*Gas to be handled	Kind of gas			
		Composition (wt%, vol% etc.)			
		Water content in the gas (wt%, vol% etc.)			
-2	*Required capacity (Nm³/hr, m³/hr(actual), kg/h etc.)				
-3	*Suction pressure (MPa, kPa, mmAq etc.)				
-4	*Suction temperature (℃ etc.)				
-5	*Discharge pressure (MPa, kPa, mmAq etc.)				
-6	Discharge temperature (℃ etc.)				
8	Utility conditions				
-1	Electricity	Main	Voltage (V)	*Frequency (Hz)	Phase (φ)
		Auxiliary	Voltage (V)	Frequency (Hz)	Phase (φ)
		Control	Voltage (V)	Frequency (Hz)	Phase (φ)
-2	Cooling water		Supply temperature (°C)	Max. return temperature (°C)	Fouling factor (m²K/W etc.)
-3	Instrumentation air		Max. pressure (MPa etc.)	Min. pressure (MPa etc.)	
-4	Steam		Pressure (MPa etc.)	Temperature (°C)	
9	Required oil carry-over				
10	Special requirement				
11	Accessories and other requirement if any				

Items with * are mandatory.

MAYEKAWA MYCOM

The content of this brochure is subject to change without notice due to product improvement, etc.

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MYCOM
PROCESS COMPRESSORS

MAYEKAWA

Since its establishment in 1924, Mayekawa has been designing, manufacturing, and providing compression packages and refrigeration systems including our core product of compressors under the brand name of "MYCOM".
After commencing production in 1964, MYCOM screw compressors have been highly appreciated in terms of our distinguished technology and reliability throughout the world. Mayekawa has now grown to be one of the leading manufacturers globally of oil-flooded screw compressors and is still continuing further technological innovation to respond to the wide range of customer expectation.

Proven gas compression technology

The technology of Mayekawa, with over 85 years of development, has enabled gas compression for virtually all kinds of gases under various conditions. For example:

- Vapor recovery gases at offshore plants (platforms, etc.)
- Gases containing corrosive components like sour gas, flare gas, or coke oven gas.
- Hydrocarbon gases -CmHn (VOC vapor, solvent recovery, wellhead gas gathering, etc.)
- Raw material gases such as vinyl chloride monomer and methyl chloride, etc.
- Corrosive gases such as chlorine, hydrogen chloride, hydrogen sulfide, C_2F_4, etc.
- Natural refrigerants such as propane, propylene, butane, pentane, ammonia, etc.
- Fuel gases such as natural gas, town gas, coal seam gas, etc.
- Industrial gases such as helium, hydrogen, carbon dioxide, air, etc.
- Refrigerant gases including HCFC, HFC
- Dimethyl ether(DME), sewage gas, carbon monoxide

Global support

1. MYCOM compressors are operating at major oil and gas companies and chemical companies around the world. Such as:

   SHELL, BP, EXXON-MOBIL, CHEVRON, TOTAL, PETROBRAS, PEMEX, ARAMCO, KOC, DOW, DU-PONT, SABIC, BASF, UOP, FLUOR, TECHNIP, TECNIMONT, FOSTER WHEELER, KBR, LINDE, UHDE, JGC, CHIYODA, TOYO, HYUNDAI, SAMSUNG, FERMI NATIONAL ACCELERATOR LABORATORY, European Laboratory for Particle Physics(CERN), Japan Atomic Energy Agency (JAEA), etc.

2. International standards compliance in addition to Japanese standards.

   - International standards: API, ASME, TEMA, SEL, IEC, NEC, ABS etc.
   - Japanese standards: High Pressure Gas Safety Law, Japan Petroleum Institute (JPI),

MYCOM compressors are actively contributing in the fields where the highest technology and reliability are demanded.

Offshore plant (platform) vapor recovery compressors / Oil Company A
320M/630kW (2 sets)
To prevent further environmental depredations and because of its proven experiences handling contaminated and water saturated heavy hydrocarbons, MYCOM compressors were chosen and installed to recover the natural gas which used to be burned as waste in a flare stack on the offshore platform.

Refinery off-gas compressors / Refinery B
320S/1150kW (2 sets)
Mixed hydrocarbon gases containing saturated H_2O, H_2, CO, CO_2, H_2S, tar, sludge etc. are compressed as fuel gas for gas turbine generation.
Long term continuous operation is ensured by Mayekawa' s high reliability and durability standards.

Compressor for solvent recovery at synthetic rubber plant / Chemical Company C
250L/280kW (1 set)
MYCOM oil-flooded screw compressor was chosen to replace an oil-free reciprocating compressor and dry screw compressor for iso-pentane solvent recovery at a polyethylene production plant, and now is greatly appreciated because of its superior durability and reliability.

Butane refrigeration system at offshore de-hydration plant / Oil & Gas Company D
320S/450kW (2 sets) 320M/555kW (2 sets)
While the use of natural refrigerants has been receiving increasing attention in recent years due to ozone depletion concerns, Mayekawa has had a long established practice of providing ecologically-friendly refrigeration systems using butane and the like as refrigerants through its many years of experience compressing heavy hydrocarbons.

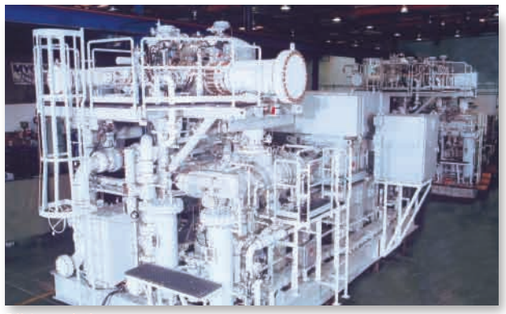
Heat pump system for distillation column reboiler / Chemical Company E
320S/370kW (2 sets)
Environmentally friendly pentane refrigeration cycle recaptures formerly wasted heat produced by the distillation column reboiler.

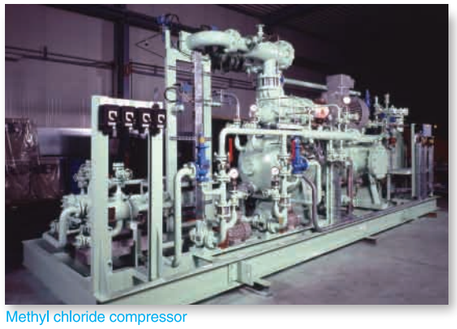
Hydrogen chloride gas compressor packages / Chemical Company F
320L/590kW (3 sets)
Replacing the old standard of high maintenance, oil-free reciprocating compressors, MYCOM compressors have enabled successful long term operation at this plant and more than 40 units have been supplied.

Hydrogen gas compressors / Chemical Company G
320L/920kW (3 sets)
Hydrogen gas compressors handling the smallest M.W. gas (difficult to compress) have been installed at the world largest hydrogen liquefaction plant owned by chemical company G and are successfully operating. Liquefied hydrogen fuel for the Space Shuttle of NASA is also compressed and produced by MYCOM compressors.

Helium gas compressors / Research Center H
4025C/540kW (4 sets)
Mayekawa's large helium two-stage compound compressors are in operation at many cryogenic laboratories throughout the world. Most research institutes for particle physics and in the nuclear fusion field are using MYCOM compressors.


Carbon dioxide gas compressor


Offshore platform vapor recovery compressor

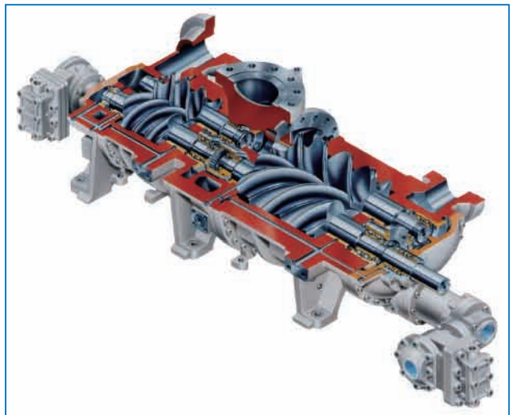

Methyl chloride compressor


Large-sized helium two stage compound compressor

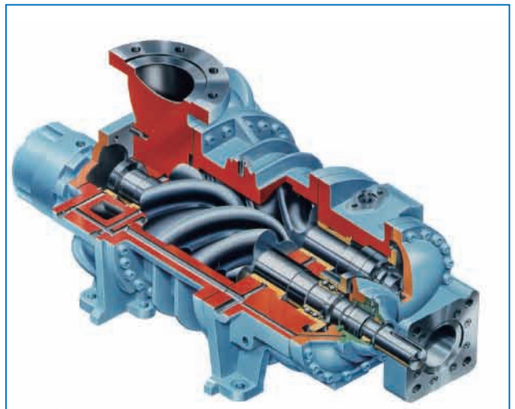
Like reciprocating compressors, screw compressors are also classified as positive displacement compressors. However, the compression system is very unique.

Compression mechanism

Compression is achieved by successive volume reduction of the space enclosed between the meshing line formed by the rotation of the male / female rotors and the casing.
During the suction phase, the un-meshing of the two lobes moving away from the suction port creates a volume for the intake gas.
When the trapped volume reaches its maximum, the gas is sealed between the rotors (between the suction port and the discharge port) and the casing.
As the rotors continue to rotate, the meshing line of the lobes moves toward the discharge end of the casing and the trapped volume gradually decreases, resulting in gas compression.
At the moment when compression reaches the designated ratio, this trapped volume becomes exposed to the discharge port and exits as a compressed gas.
These phases are continuously performed.



Two stage compound compressors



Single stage compressors

Durability / Reliability / Maintainability

Compared to a conventional reciprocating compressor, a screw compressor has no consumable or fragile parts like suction/discharge valves, piston rings, etc.
Main friction-bearing parts are limited to journal bearings, thrust bearings, shaft seals and the fully lubricated intermeshing rotors, therefore the construction of the compressors is extremely simple and robust.
The rotors are also constructed with high strength and stiffness and can withstand wet gases containing mist or liquid where reciprocating or centrifugal compressors may have serious problems. Even under the most severe operating conditions, the screw compressor demonstrates very high reliability.
Fewer parts mean less maintenance work, and superior maintainability is achieved.

Low noise / Less vibration

Unlike conventional reciprocating compressors, screw compressors are perfectly balanced so no discharge gas pulsation and no excessive vibration. Also unlike centrifugal or dry type compressors, high rotation speed are not required and no high frequency noise will be experienced.

High efficiency / High performance

In oil-flooded screw compressors, lube oil is injected during the gas compression process to provide lubrication for the rotors and casing, to minimize gas leakage and to cool the gas. Therefore, discharge temperatures are lower than those that occur with dry screw compressors, and higher volumetric efficiency is achieved from low compression ratios to high compression ratios.

Bearings

Sleeve type radial bearings and anti-friction ball thrust bearings are standard but special material sleeve bearings and tilting pad thrust bearings are also available to meet the gas properties, compression conditions, and customer's requirements.

Capacity control

Built-in unloader slide valve function enables the compressor capacity to be adjusted from 10% to 100% step-less continuously. Therefore, the compressor is able to run with appropriate load given the variation of required duty across a wide range of operation, resulting in highly economical operation. In addition, capacity control by means of by-pass control valve or by variable speed inverter is available depending on the process requirement.

Shaft seal

In order to ensure high reliability and durability under all operating conditions, various kinds of shaft seals are available. The balance type single mechanical seal is used most often but a double seal, bellows seal, gas seal, etc. are also available.

Advanced rotor profile

The new rotor profile developed by Mayekawa minimizes blowholes and has increased the efficiency of compression by means of improved volumetric efficiency as compared to the conventional type.

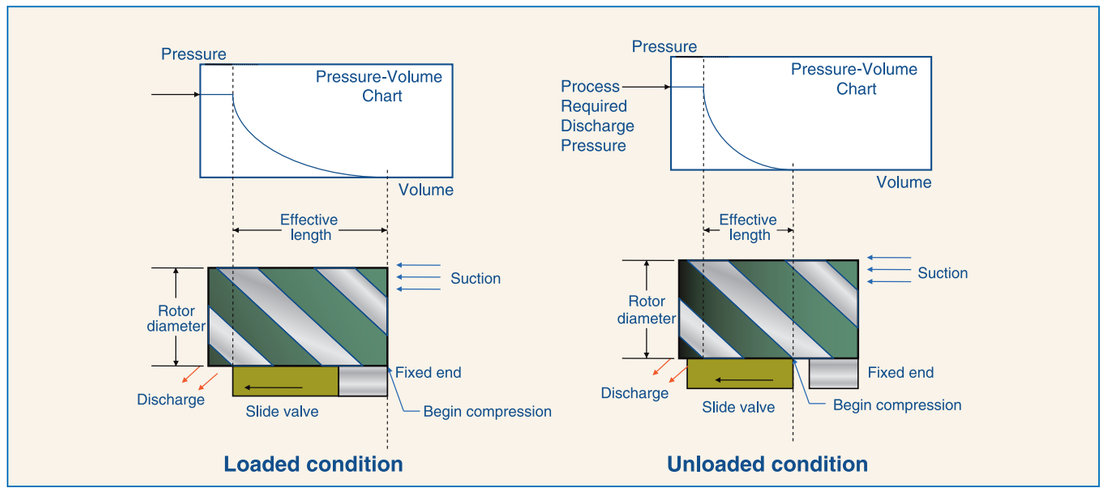
Compliance to API 619

Previously API619 was the standard for dry screw compressor exclusively, but from the 3rd edition oil-flooded screw compressor are also officially included.
Mayekawa is able to meet the specifications required by API619 such as cast steel casings, forged steel rotors, tilting pad thrust bearings, vibration and displacement probes, bearing temperature sensors, etc., to fit customers' requirements.

Comparison between various type of compressors

Items	Oil flooded screw compressors	Dry screw compressors	Reciprocating compressors	Centrifugal compressors
Type	High speed rotation positive displacement	Very high speed rotation positive displacement	Slow speed reciprocating	Extremely high speed rotation centrifugal
Capacity range	Small to big	Medium to big	Small to medium	Medium to big
Compression ratio	Low compression ratio to high compression ratio	Low compression ratio	Medium compression ratio	Low compression ratio
Discharge gas temperature	Low	High	High	Low
Deterioration of lube oil	Not particularly	Not particularly (However regular oil check is required)	Faster deterioration because of higher temperature	Not particularly (However regular oil check is required)
Capacity control	Step-less regulation by slide valve	Suction throttling or external by-pass	Step control by unloader	Step-less by Vane but surging problem in lower unloaded conditions
Impact due to Pressure change	Stable	Stable	Relatively stable	Unstable
Mechanical wear	Very few	Very few	Wears in piston rings, cylinders, etc.	Very few
Moving valves	No	No	Suction/discharge plate valves are damage prone	No
Vibration	Very few	Very few	Larger vibrations caused by unbalance	Very few
Noise	Medium (High frequency)	Large (High frequency)	Large (Low frequency)	Small (High frequency)
Durability in general	High	Relatively high	Low	High
Durability against entry of mist, powder, oil, etc.	High	Relatively high	Low (Wear in cylinder, damage on plate valves, etc.)	Low (Damage of impeller)
Maintenance	Not required in longer period	Not required in longer period	Required in shorter period	Not required in longer period
Footprint, Foundation requirement	Small, relatively simple	Small, relatively simple	Large and robust foundation required	Small, relatively simple

Capacity control (Slide valve mechanism)

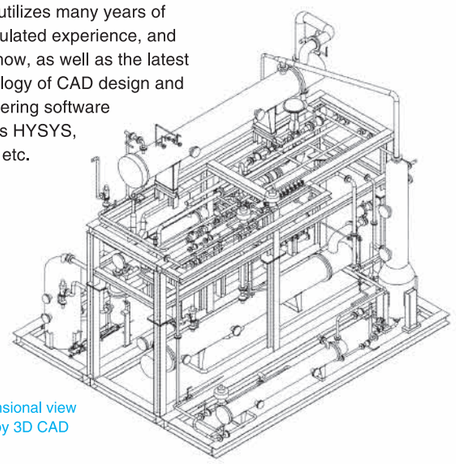


Compression systems / Packages

Mayekawa selects compressors to achieve the most optimum performance under the intended process conditions for compression system packages. Packages are proposed to satisfy the process requirements and plant conditions, and also to enable time and cost savings for installation at the customer's site.

Engineering

Not only compression but a wide range of systems such as liquefaction, refrigeration, etc., can be quickly and accurately designed with Mayekawa's established engineering resources which utilizes many years of accumulated experience, and know-how, as well as the latest technology of CAD design and engineering software such as HYSYS, BJAC, etc.



3-dimensional view drawn by 3D CAD

● Oil separation system

Oil carry over can be reduced to almost the same level experienced with dry compressors by introducing the fine oil separation system developed through Mayekawa' s broad experience with plants which cannot allow serious oil contamination like helium liquefaction or cryogenic systems.

● Driving system

Compressor drivers can be not only electric motors but also reciprocating engines or turbines utilizing various energy sources such as gas, liquid fuel, steam, etc.

● Extended supply of complete plant

Provisioning complete plants associated with peripheral equipment is also possible, not just supply of simple packages with our core product, compressors. Mayekawa has successfully completed various kinds of plants requested by customers. For example, CO_2 purification plants, gas turbine power generation plants, boil off gas plants, gas liquefaction, distillation and recovery plants, etc.

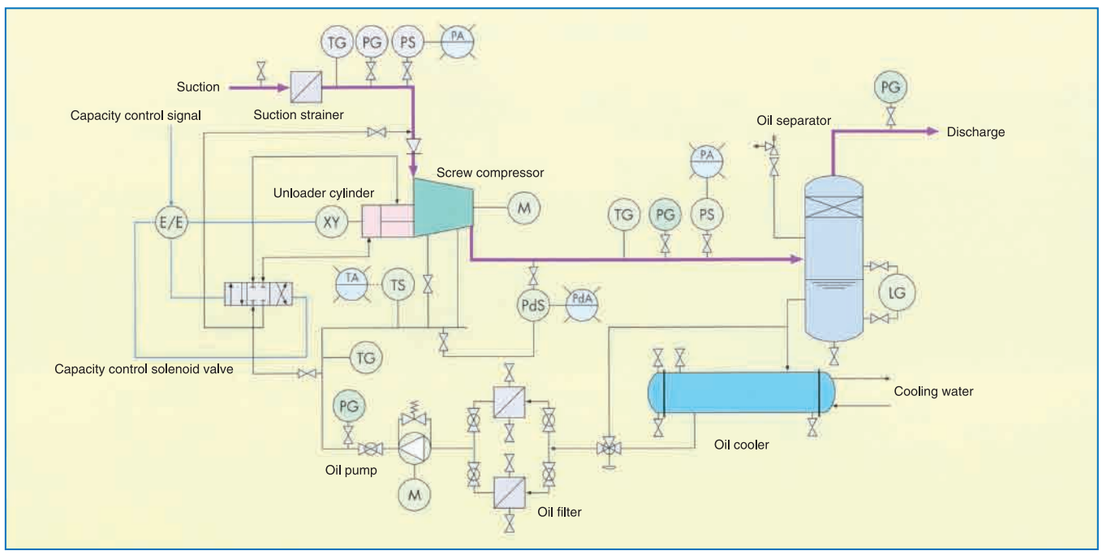
Compliance to codes and standards

Any applicable international codes, standards and customer's specific rules can be complied with as well as API standards so that the individual needs of customers throughout the world are satisfied.

Control system

A number of expert engineers with professional knowledge of compressor systems are ready to supply control systems compliant with international standards, including hazardous area applications. Also, instrument systems, PLC devices, communication methods to DCS or plant computer, etc., can be designed and supplied to accommodate all types of plant philosophies.

Plant control room



Manufacturing / Service centers

In order to provide local superior quality engineering services, Mayekawa has been establishing a number of activity centers including manufacturing, sales, designing, and technical support services. Especially in the field of after-sales services, consistent support from commissioning to regular maintenance work as well as prompt delivery of spares are fully available throughout the world.

Moriya Plant

Overseas offices

USA, CANADA, BELGIUM, GERMANY, UK, SPAIN, FRANCE, BULGARIA, SWITZERLAND, UAE, RUSSIA, TURKEY, ITALY, AUSTRALIA, NEW ZEALAND, INDONESIA, MALAYSIA, PHILIPPINES, SINGAPORE, TAIWAN, CHINA, THAILAND, VIETNAM, KOREA, INDIA, ARGENTINA, PERU, CHILE, COLUMBIA, BRAZIL, COSTA RICA, VENEZUELA, MEXICO, ECUADOR

Within Japan

60 places/ Tokyo, Ibaraki (Main plant), Osaka, Nagoya, Fukuoka, Hiroshima, Okayama, Yokohama, Niigata, Matsuyama etc.