

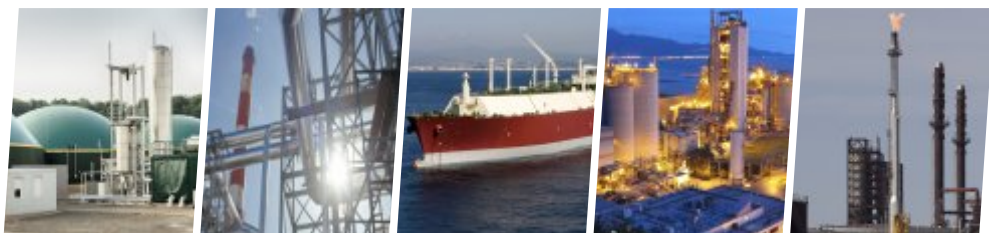
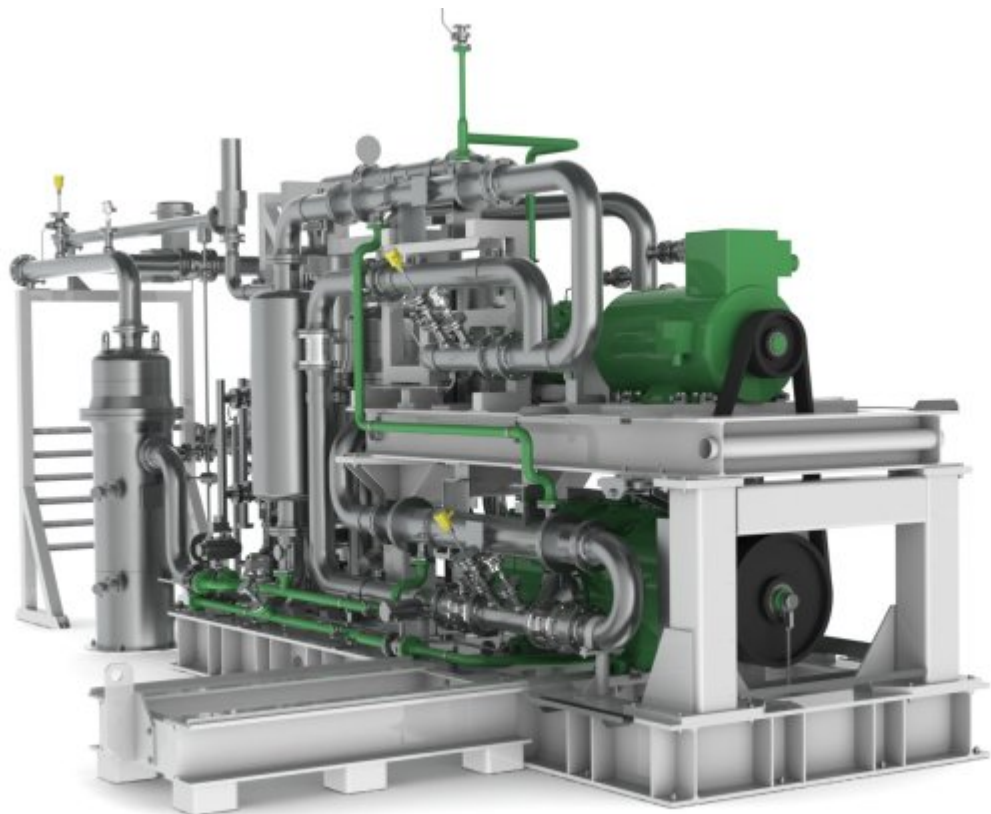
Engineered
Gas Handling
Solutions

AIR AND GAS HANDLING SOLUTIONS

Sliding vane or liquid ring compressors

Sliding vane or liquid vacuum pumps

Process skid



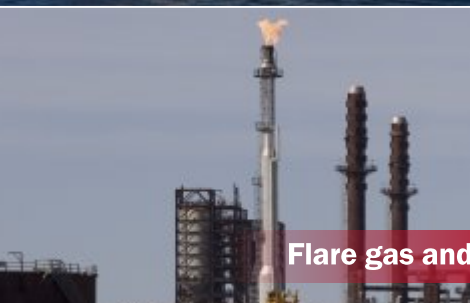
 **MPR Industries**
A Moret Industries Company

www.mpr-industries.com

MARKETS |



LNG Carrier



Flare gas and vapour recovery system



Biogas installation



Cement production and mining



Industrial vacuum pumps and compressors

/ Designer of rotary machines for air and gas, MPR Industries has more than 90 years of experience in industrial applications, in the field of compressors, vacuum pumps and blowers.

/ With a large number of customers all around the world and a wide range of products perfectly adapted to your needs, MPR Industries is a world-renowned supplier of **reliable and efficient solutions for handling air and gas** in many industrial applications.

/ MPR Industries provides a large range of products to meet the needs of various applications as well as **bespoke systems** designed on the exact process specifications / requirements of our customers.

/ With a volumetric technology using **sliding vane** or **liquid ring**, MPR Industries offers a complete range of **compressors** and **vacuum pumps** which can reach flows up to 22,000 m³/h (97,000 USgpm). MPR Industries also has a range of **side channel blowers** and **roots blowers** offering flows from a few dozens cubic meters per hour to many thousands.

/ Thanks to its internal engineering department, MPR Industries can develop a solution that will fit any of its customers' needs, whatever technology is required to meet the specifications.

/ Established in 1921 by the Swiss engineers that initially invented the sliding vane technology, MPR Industries became a subsidiary of **Ensival Moret** in 2012, thus entering the Pumps Division of the **Moret Industries Group**. Within the Ensival Moret Division, MPR Industries is in charge of supplying air and gas handling solutions.

/ MPR Industries has manufacturing facilities and a commercial office near Paris and a wide network of agents based in different countries all over the world.



Sliding vane compressor



Liquid ring compressor



Liquid ring vacuum pump



Sliding vane vacuum pump



Roots



Side channel blower



Skid - Integrated systems

| PRODUCTS

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PRODUCTS |



Sliding vane compressor

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Liquid ring compressor

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Liquid ring vacuum pump

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Sliding vane vacuum pump

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Roots

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Side channel blower

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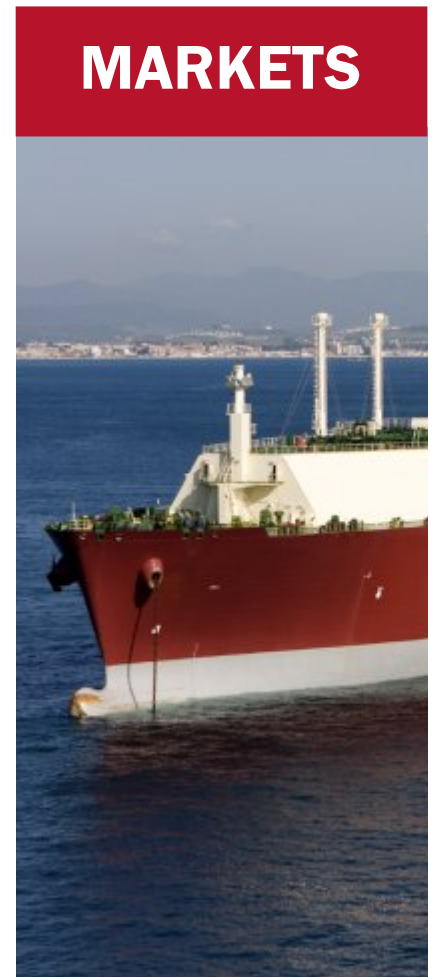
Skid - Integrated systems

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LNG Carrier

For more than 40 years, MPR Industries has equipped a significant number of LNG Carriers all around the world. MPR Industries participated in cooperation with GTT (company that created the LNG carrier design that represents over 80% of the market share today) in the definition of the NO96 type standard for LNG Carrier construction, with a double envelope under vacuum, also called Membrane.

MPR Industries supplies the vacuum pumps that create and maintain the vacuum between the walls of the ship and therefore ensure the safety onboard. These pumps are also used to evacuate potential sewage that may end up in the double envelope, allowing a reduction of the LNG carrier maintenance costs.



/ P & PF Sliding vane vacuum pump:

- Flow up to 22,000 m³/h (96,873 USgpm)
- Vacuum down to 100 mbar abs (1.45 psi)



/ Benefits:

- Easy to install (plug and play)
- Improved bulkhead seal
- Low maintenance costs
- No need for sewage
- No pollution
- Low vibrating level
- Lifetime equal or superior to the lifetime of a NO type LNG carrier
- MTBF > 5 years

/ Some references:

Chantiers de l'Atlantique, DSME, Ficantieri, Hanjin, Mitsubishi, STX...

Flare gas and vapour recovery system



Flare gas recovery system

Flare is used to burn hydrocarbons coming from different steps of the oil refining process, or from the gas field operation, but it is primarily a safety device. You cannot remove the flare, you cannot prevent hydrocarbons from reaching the flare, but you can eliminate non-safety flaring.

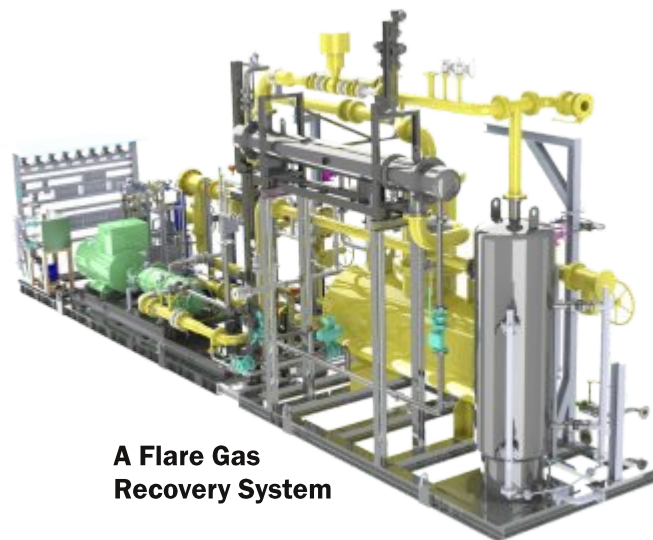
Typically, all waste gases go to flare:

- Relief valve leakage
- Control valve leakage
- Normal gas flow rates
- Vent gas
- Header sweep gas
- Emergency Releases

Some are clean enough and can be used to feed a power generation system directly or can be sent to storage/distribution facilities, some are not and need to be redirected to the inlet of the refining process. A Flare Gas Recovery Unit pays back for itself in 16 to 48 months, depending on the complexity of the installation.

With over 35 references, MPR Industries is a leading global supplier of Flare Gas Recovery Systems.

We will design, manufacture and install a bespoke system that absolutely fits our customers' needs and gas characteristics. We can supply either the compressor (single or multistage sliding vane, or single stage liquid ring technologies) or the plug-and-play skidded Flare Gas Recovery Unit.



A Flare Gas Recovery System

Mobile and shelterized recovery system

MPR Industries has a long record of R&D activity. We have developed a system dedicated to alternative gas fields like Shale gas or Mine gas.

This plug-and-play, shelterized system is fully independent and offers key benefits :

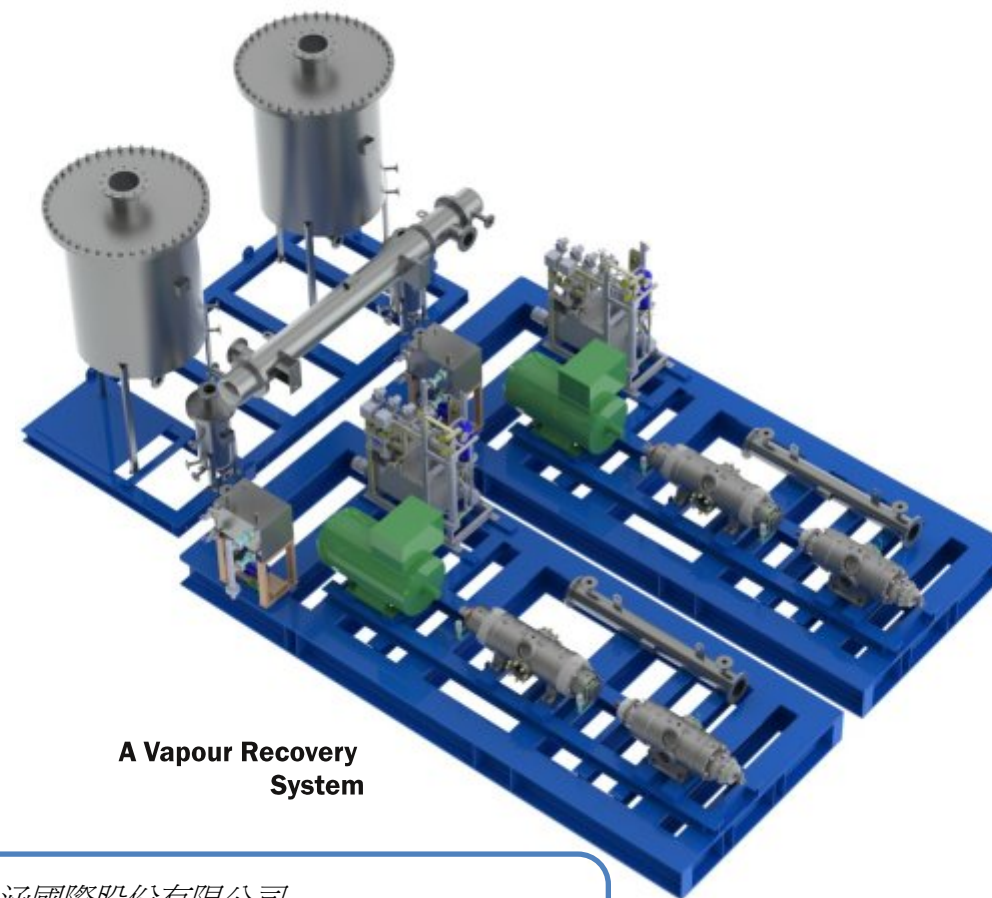
- it has no water consumption
- it handles both water and sand along with the gas
- it may be moved by truck so as to be set up in any other location where you may need it.

Vapour recovery system

MPR industries is a leading supplier of systems designed to handle hydrocarbon vapours coming out of all storage and process facilities. Vapour Recovery Units supplied by MPR Industries enable to meet all new regulations in terms of storage design, vapour capturing and reuse. They are designed to handle hydrocarbon gases containing all types of impurities such as H₂S, asphaltenes/bitumenes, chlorides, etc...

Our systems are designed to maximize Return On Investment and have an average lifetime of 30 years. Their design allows MTBF of up to 40.000 hrs.

Our Vapour Recovery Units can be made either with our in-house Sliding Vane or Liquid Ring compressors or with a reciprocating compressor sourced from a third party. All our machines can be made to any standard and code (ASME, ABSA, API, CODAP, etc...)



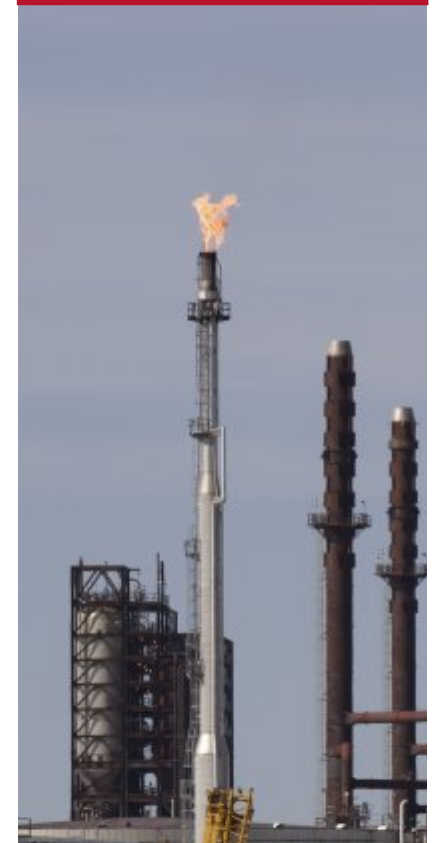
A Vapour Recovery System

千涵國際股份有限公司

張曙光 / 總經理

手機 0927120778 ,E-mail: kflow@seed.net.tw

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/ Sliding vane technology:

- Flow up to : 6,000 m³/h (26,400 USgpm)
- Pressure up to 25 bar (375 psi)

/ Liquid ring technology:

- Flow up to 12,500 m³/h (55,000 USgpm)
- Pressure up to 4,8 bar (70 psi)

/ Some references:

Total, Shell, ENI, Samir, Syrian Gas Company, SIR, MOL, Lyondell Basell, Sofresid Sonatrach...

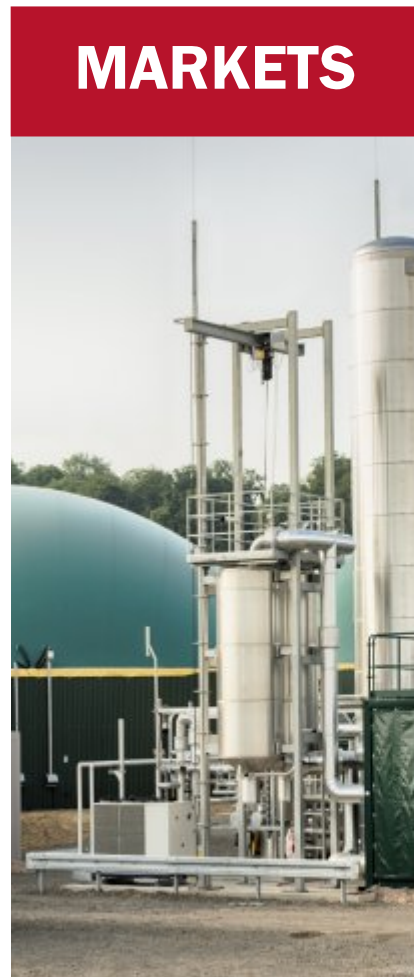
Biogas installation

MPR Industries began to supply compressors for the mixing of sludge digestors in Waste Water Treatment Plants in 1980. As of today, with more than 300 references, MPR Industries is a key player in this industry. Compressors for sludge digestors can be supplied with either sliding vane or liquid ring technology.

MPR Industries also has a complete range of side channel blowers and a range of roots blowers, that are used for the transport of biogas. MPR Industries is present on a large number of digestors on Waste Water Treatment Plants in France and all over the world (approx. 30 countries), as well as a growing number of digestors from Industrial Anaerobic Digestion facilities.

The use of MPR Industries compressors to re-inject biogas at the bottom of the digester to mix sludge improves the overall Anaerobic Digestion process efficiency.

MPR Industries has developed specific biodegradable oil for the lubrication of its sliding vane compressors. This oil is perfectly degraded by the methanogenic bacteria which further enhances overall AD efficiency.



/ Applications:

- Collection and transport of biogas on landfills
- Mixing of Anaerobic Digestors on AD facilities
- Mixing of Sludge Digestors from Waste Water Treatment Plants

/ Benefits:

- Reliable
- Lifetime over 30 years
- Limited vibrations
- Very high productivity
- No contamination

/ Some references:

Degrémont, OTV, Suez, Siaap, Coca-Cola, Lyonnaise des eaux, K & K Technology...



/ R or RF sliding compressor:

- Flow up to 10,000 m³/h (44,000 USgpm)
- Pressure up to 15 bar (215 psi)

/ CL Side channel blowers:

- Flow up to 12,000 m³/h (52,000 USgpm)
- Pressure up to 300 mbar (4.35 psi)

/ SEM or SEM V Roots:

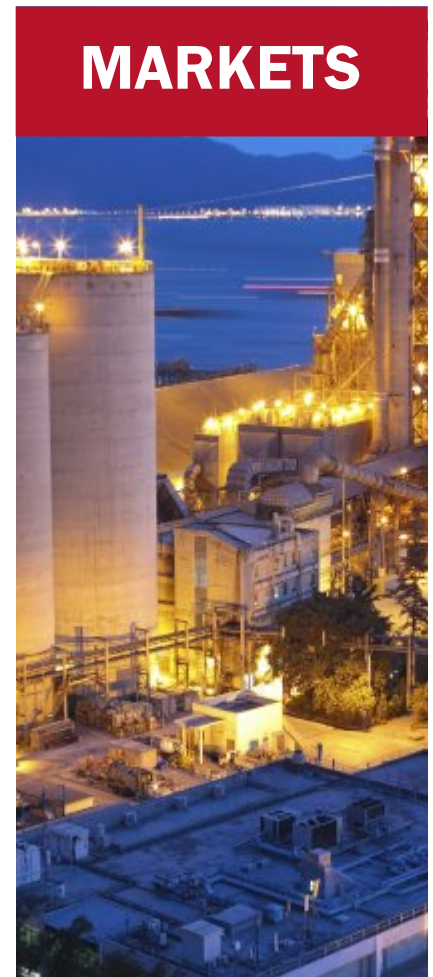
- Flow : from 50 to 22,700 m³/h (from 220 USgpm up to 99,956 USgpm)
- Pressure up to 1.6 bar (23 psi)

Cement production and Mining

In the cement manufacturing process, or in mining operations, compressors from MPR Industries, using sliding vane technology, are used for the pneumatic transport of the crude flour, which comes from the shredding and drying processes.

This flour is then sent to the storage silos as a “dry” or “semi-dry” material, or to the mixing / preparation processes.

Our compressors can handle a significant amount of dust without degrading and without needing a high performance (and costly) filtering system. Our compressors are also very easy to maintain and do not require a specifically trained maintenance team. They are therefore ideal for all cement kilns processes which are to be installed in developing countries, as well as open field mining/preparation sites.



/ Benefits:

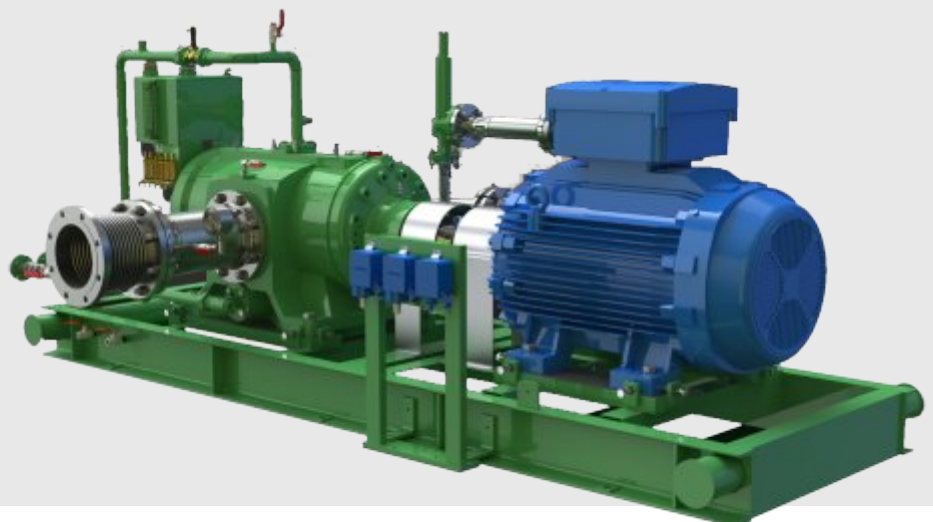
- Easy to operate
- Limited vibrations
- Increased lifetime
- Very high productivity
- Easy maintenance
- Low operating costs
- Reduced maintenance costs
- Life time over 15 years
- Low weight and limited footprint

/ Some references:

Lafarge, SCMI, CBR, Cementos
Catatumbo, HBL,
Polysius ...

/ R sliding compressor:

- Flow up to 6,100 m³/h (27,000 USgpm)
- Pressure up to 20 bar (44 psi)



Industrial vacuum pumps and compressors

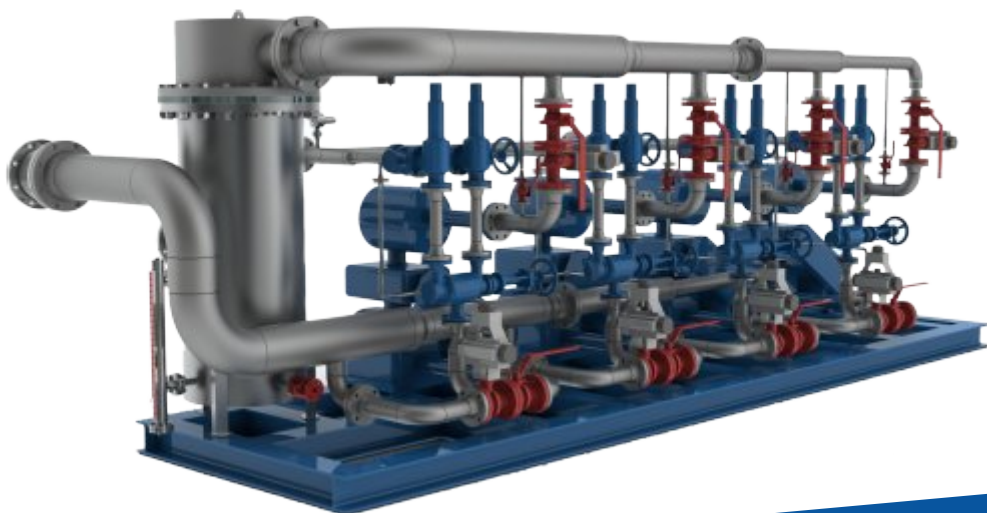
MPR Industries has a wide experience of vacuum pumps and compressors designed for every specific needs of the chemical, petrochemical, food, pharmaceutical industries, as well as for the specific needs of the Energy sector.

Because we have our own internal engineering department, with a wide knowledge of multiple compressors technologies, and because we are equipped to manufacture, assemble and test integrated systems with any compression / vacuum technology, we provide our customers with the best solution that will exactly fit the required specifications.

MPR Industries has some specific know-how when it comes to handle complicated, explosive, corrosive chemical substances with potentially high loads of suspended solids. MPR Industries has a wide experience in particular processes such as:

- Compressors for gases from coal mines, wells, shale gas, coal bed methane
- Vacuum pumps for the production of methionin (integrated plug-and-play systems which are part of the manufacturing process)
- Surpressors/compressors for natural gas / turbines
- Compressors and vacuum pumps for the chemical, pharmaceutical and food-processing industry.

Our systems integrate solutions using vane, liquid ring or roots type technologies, alone or combined. Thanks to its knowledge of customer processes, MPR Industries is not only able to deliver a mechanical warranty, like most suppliers of compressors / vacuum pumps do, but also some process warranties.



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/ Benefits:

- Lifetime over 30 years
- Reduced maintenance cost
- Easy maintenance operations
- Equipment entirely automated and independent

/ Operating capacities - Skids:

On request, according to the specifications

/ Some references:

Adisseo, Arkema, EDF, EADS, Alstom, French Atomic Agency (CEA), Eurocopter, Lubrizol...

Design:

- / Cast iron cylinder with surface treatment, simple casing for air-cooled machines and double casing for liquid cooled machines
- / Bare shaft or skidded
- / One-piece steel rotor
- / Vanes are manufactured from high-strength composite materials (phenolic resin and aramide fibers) or from a specific polymer
- / Single or double mechanical seal
- / Roller bearings, ball bearings, double taper roller bearing, depending on the application
- / API Coupling
- / Proprietary micro-lubrication system: oil pump driven by compressor shaft or by independent electric motor (Minilub). Monitoring as an option
- / Check valve on discharge
- / Suction and discharge manometer
- / Temperature and pressure switches on suction
- / Inlet filter (strainer or ceramic plug type)
- / Factory test with test report
- / Long conservation packing with nitrogen insulation
- / Engineering and documentation
- / Automation



Performances:

- / Flow rate: from 5 to 6,000 m³/h (from 22 to 26,500 USgpm)
- / Pressure: above 30 bar (435 psi)

Standard materials:

- / Cast iron or nodular cast iron casing
- / Steel rotor
- / Other materials according to the customer's technical requirements

Industrial applications:

- / Flare & vent gas
- / Collection and transport of biogas on landfills
- / Mixing of Anaerobic Digestors on AD facilities
- / Mixing of Sludge Digestors from Waste Water Treatment Plants
- / Cogeneration
- / Process compressor (chemical, food, pharmaceutical...)
- / Mine gas compressor
- / Steam compressor
- / Petrol gas booster/surpressor

Design:

- / Cast iron or stainless steel casing, other materials on request
- / Water circulation controller
- / Bare shaft or skidded
- / Impeller made of carbon steel or stainless steel, other material on request
- / Roller bearings, ball bearings, double taper roller bearing, depending on the application
- / Single or double mechanical seal
- / API Coupling
- / Check valve on discharge
- / Suction and discharge manometer
- / Temperature and pressure switches on suction
- / Gas/water separator
- / Factory test with test report
- / Long conservation packing with nitrogen insulation
- / Engineering and documentation
- / Automation



Performances:

- / Flow rate: from 800 to 15 000 m³/h (from 3,500 to 66,000 USgpm)
- / Pressure: from 1.2 to 4.7 bar (from 17 to 68 psi)

Standard materials:

- / Cast iron with nodular cast iron impeller
 - / Cast iron, impeller in stainless steel
 - / 18/10/2.5 stainless steel*
 - / 26/5/2+ Cu stainless steel*
 - / Other materials according to the customer's technical requirements
- * Values as percentages of Cr/Ni/Mo.*

Industrial applications:

- / Flare & vent gas
- / Mixing of Anaerobic Digestors on AD facilities
- / Mixing of Sludge Digestors from Waste Water Treatment Plants
- / Process compressor

Design:

- / Cast iron cylinder with/without surface treatment (application dependent), simple casing for air-cooled machines and double casing for liquid-cooled machines
- / Bare shaft or skidded
- / One-piece steel forged steel/stainless steel rotor
- / Vanes are manufactured from high-strength composite materials (phenolic resin and aramide fibers) or from specific polymer
- / Roller bearings, ball bearings, double taper roller bearing, depending on the application
- / Single or double mechanical seal
- / API Coupling
- / Proprietary micro-lubrication system: oil pump driven by compressor shaft or by independent electric motor (Minilub). Monitoring as an option
- / Check valve on discharge
- / Suction and discharge manometer
- / Inlet /outlet filter (strainer or ceramic plug type)
- / Factory test with test report
- / Long conservation packing with nitrogen insulation
- / Engineering and documentation
- / Automation



Performances:

- / Flow : up to 6,000 m³/h (26,500 USgpm)
- / Pressure : up to 10⁻⁴ mbar abs

Standard materials:

- / Cast iron or nodular cast iron casing
- / Steel rotor
- / Other materials according to the customer's technical requirements

Industrial applications:

- / General vacuum
- / Coalmine gas from closed pits
- / Large test facilities, large flow pumps (space industry simulation tests)
- / Power station condensers
- / Metal surface treatment / vacuum coating
- / Process vacuum in chemical and nuclear industries
- / Vacuum drying
- / Vacuum extrusion and injection processes

Design:

- / Cast iron or stainless steel casing, other materials on request
- / Water circulation controller
- / Bare shaft or skidded
- / Impeller made of carbon steel or stainless steel, other material on request
- / Roller bearings, ball bearings, double taper roller bearings, depending on the application
- / Mechanical seal (simple or double)
- / Check valve on discharge
- / Suction and discharge manometer
- / Temperature and pressure switches on suction
- / Gas/water separator
- / Factory test with test report
- / Long conservation packing with nitrogen insulation
- / Engineering and documentation
- / Automation



Performances:

- / Flow: up to 22,000 m³/h (100,000 USgpm)
- / Vacuum: up to 10 mbar (abs)
- / Pressure: up to 0.8 bar (11,6 psi)

Standard materials:

- / Cast iron with nodular cast iron impeller
- / 18/10/2.5 stainless steel*
- / 26/5/2+Cu stainless steel*
- / Other materials on request

* Values as percentages of Cr/Ni/Mo

Industrial applications:

- / General vacuum
- / Coalmine gas from closed pits
- / Large test facilities, large flow pumps (space industry simulation tests)
- / Power station condensers
- / Metal surface treatment / vacuum coating
- / Process vacuum in chemical and nuclear industries
- / Vacuum drying
- / Vacuum extrusion and injection processes

Design:

- / Gas leak-proof die cast aluminum casing with anti-corrosion surface treatment
- / Viton lip seal
- / Specific suction filter for biogas application with strainer
- / Close-coupled electric motor
- / Fully assembled skid (tested and painted)



Performances:

- / Flow : up to 2,000 m³/h (9,000 USgpm)
- / Pressure: up to 1.05 bar (15 psi)

Standard materials:

- / Aluminum and anodized aluminum casing
- / Other materials according to the customer's technical requirements

Industrial applications:

- / Collection and transport of biogas on landfills
- / Cogeneration
- / Oxygenation of basins
- / Petrol gas booster

Design:

- / Cast iron or stainless steel casing
- / V-Belt or direct drive
- / Impeller made of carbon steel or stainless steel
- / Roller bearings, ball bearings, double taper roller bearings, depending on the application
- / Single or double mechanical seal
- / Check valve on discharge
- / Suction and discharge manometer
- / Temperature and pressure switches on suction
- / Inlet filter (ceramic plug type)
- / Factory test with test report
- / Long conservation packing with nitrogen insulation
- / Engineering and documentation
- / Automation



Performances:

- / Flow: from 50 to 22,700 m³/h
(from 220 to 100,000 USgpm)
- / Pressure: from 0.4 bar (abs) to 1 bar (abs)
(from 6 to 15 psi)

Standard materials:

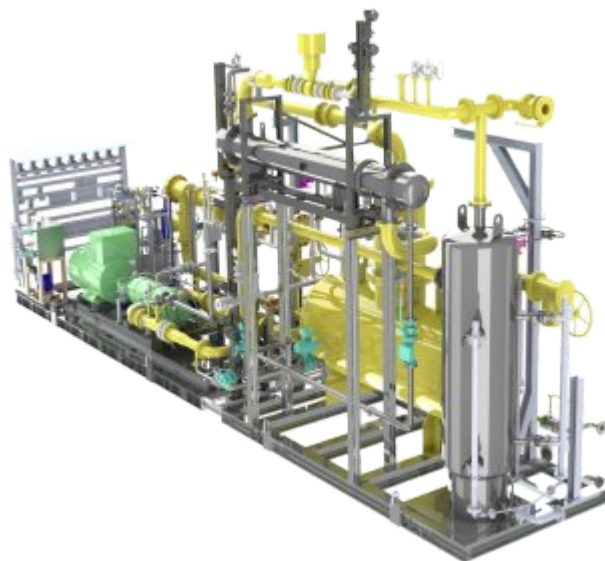
- / Cast iron or stainless steel

Industrial applications:

- / Collection and transport of biogas on landfills
- / Cogeneration
- / Process compressor / booster
- / Petrol gas boosting

Design:

- / Every system supplied by MPR Industries is a bespoke system designed on the basis of our customers' exact process specifications / requirements.
- / Our machines are built around a compressor technology (supplied by MPR Industries or another supplier): filters/strainers, scrubbers, oil/gas separators, demisters, process and compressor heat exchangers, evaporators, condensers, ducting/piping, valves,....
- / Each machine is designed with its own safety monitoring system, process monitoring system (recycle valves, VEV system,...). All components and design to be used are chosen according to the customers' required MTBF and uptime. Our machines typically accept up to 40.000 Hrs MTBF and 99.96% uptime.
- / Fully packaged system: pre-assembled, wired and tested at the factory.
- / Automation of the system to meet the individual requirements.
- / Efficient and reliable solution for the most demanding industries: flare gas recovery units, gas compression and treatment, industrial gases, gas transportation and storage ...
- / Fully mobile Plug-and-Play System in its shelter or integrated into the plant.
- / MPR Industries designs skidded systems according to various standards: ASME, API, ANSI, NEMA, IEC, ATEX ...



Performances:

- / For this kind of machines, MPR Industries guarantees process data, uptime and availability

Standard materials:

- / Materials according to the customer's technical requirements

Customer support services

“ Mechanical inspection, performance analysis, or complete refurbishment, MPR Industries will provide you with the best solution to your needs ”

Refurbishment - Maintenance - Retrofit



All brands and types of vacuum pumps, compressors and blowers can be serviced. Our qualified technicians and repairmen are able to provide complete repairs restoring your equipment to their original condition.

After refurbishment, the equipment is tested and returned to your facility with a full factory warranty. A summary report is also provided to document the work.

A network you can count on

We offer timely and high quality repair services. Our service technicians can perform repairs at one of our service centers or on-site.

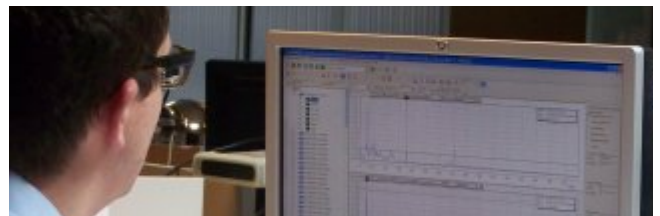
MPR Industries also offers complete maintenance packages that can be tailored to meet customer requirements. This includes:

- Maintenance contract
- Preventive maintenance
- System optimization
- Noise attenuation
- Filtration
- Vibration analysis
- Alignment
- Remanufactured blowers...

Commissioning

The quality of start-up and commissioning operations is fundamental to the reliability of the gas process solutions.

Our team brings their expertise knowledge to meet your needs. From the installation to the contractual performances validation, we ensure that each operation is carried out in order to deliver the performance and reliability you are expecting from your installation.



Engineering services for gas process system

MPR Industries supports its customers throughout the complete lifecycle of their installations.

Our multidisciplinary skilled team of engineers can support all of your projects with specific needs:

- compression improvement
- automation
- energy efficiency
- Key components reengineering
- Monitoring

Innovations provider

With a hundred-year experience in the design and manufacturing of industrial pumps, Ensival Moret is a world-famous supplier whose know-how is internationally recognised. Renowned for its reliable technical solutions and high quality products, **Ensival Moret supplies a wide range of industrial pumps for meeting all industrial requirements, even the most specific ones with difficult pumping conditions.**

Ensival Moret offers a complete range of centrifugal and mixed flow pumps for a capacity up to 30.000 m³/h (132,000 USgpm) with operating temperatures from -160°C to +900°C (from -256°F up to 1650°F). This product range also includes a series of self-priming pumps, high capacity submersible pumps and canned motor pumps. A wide choice of material is available.

PUMPING SOLUTIONS



www.ensival-moret.com



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