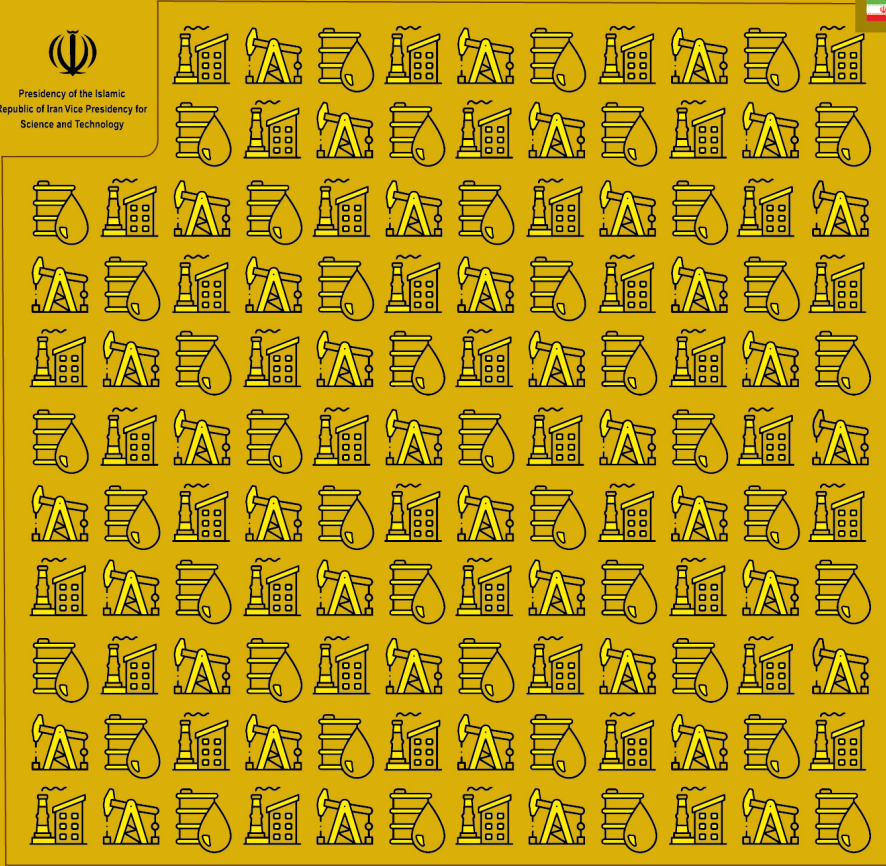




Presidency of the Islamic  
Republic of Iran Vice Presidency for  
Science and Technology



Fifth Volume

# OIL, GAS & PETROCHEMICAL

*Knowledge-Based Products and Equipment*

# مجلس المدینة العلمیة

FIFTH VOLUME

Knowledge-Based Products and Equipment  
**Oil, Gas & Petrochemical**





Presidency of the Islamic  
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## Knowledge-Based Products and Equipment

### Fifth Volume: Oil, Gas & Petrochemical

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|                    |   |
|--------------------|---|
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# Preface

One of the key factors in a nation's industrialization and economic complexity is technology. Complex economies can connect vast networks of individuals with relevant information to produce a variety of knowledge-based goods. Indeed, the types of goods or products that are ultimately supplied to international markets are taken into account when determining the complexity of an economy.

A knowledge-based economy is one in which the application of knowledge and information plays a significant role in shaping production and distribution, and where investments in knowledge-based businesses have drawn particular attention. Along with enhancing nations' competitiveness, the transformation of economies into knowledge-based economies has the potential to have a significant impact on international trade.

7000 knowledge-based businesses in Iran provide knowledge-based goods that are the result of the expertise and experience of professionals and university graduates. These businesses, which occasionally resemble enormous technology factories, sold more than 10\$ billion worth of goods last year and exported 1\$ billion or so to various nations. The Presidential Deputy for Science and Technology is recognized as the most significant authority for direction, leadership, and development of the technology area in Iran. It serves as a support organization for startups and knowledge-based businesses by finding and selecting these enterprises. This book, along with 19 other books, is a carefully curated selection of goods with a track record or export potential that was put together using data provided by chosen businesses for presentation to foreign clients, business people, and government and academic officials interested in using these goods. To review the company's manufacturing and distribution records, access to technical knowledge and specialized human resources, production and export capacities, and after-sales services, two specialized and commercial committees were formed separately, and each committee reviewed the products in detail with the participation of technical and commercial experts.

In this procedure, specialized committees were held with the collaboration of the experts of the center of companies and knowledge-based institutions of the Deputy for Science and Technology, headed by *Dr Reza Asadi Fard* and Coordinated by *Engineer Mojtaba Houshmandzadeh*. In addition, *Engineer Mehdi Ghaleh Noei* and *Engineer Ruhollah Estiri* presided over commercial committee meetings, which also included businessmen from the private sector, and I want to express my gratitude to these two groups for their work and assistance.

I also want to appreciate the project manager, *Zahra Afzali*, who has taken on a lot of responsibility and given close attention to the project's design and development from the beginning with innovative ideas.

I also think it's important to recognize and express my gratitude to my other colleagues for their efforts in gathering, reviewing, contacting firms, selecting, and rewriting texts, and finally editing and creating this book:

Project monitoring and editing team: *Mohammad Torabi, Fereshte Elahi*

Evaluation team: *Mahdi Hasanzadeh*

Editorial team: *Yusef Shadan*

Design team: *Mohammad Hossein Pourdabbaq, Masoud Khalili*

I want to underline that the aforementioned goods may be offered in a variety of ways in the country of destination, including export of end products, export of semi-finished and assembled products at the destination, joint production in the destination country and other economic cooperation. In each of the aforementioned scenarios, the Export Development and Technology Exchange Fund is prepared to co-invest in the target countries and guarantee the purchases as a financial sponsor of knowledge-based export enterprises.

The book's conclusion also includes a list of export management firms authorized by the Deputy for Science and Technology for communication, Iran Houses of Innovation & Technology (iHiTs), located in several countries, and commercialization and technology transfer agencies. Finally, I am hoping that this book will be beneficial to the readers and provide them with a thorough grasp of Iranian technological advancements.

**Regards,**  
**Mehrdad Amani Aghdam**  
**CEO of Export Development and Technology Transfer Fund**

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Knowledge-based products and equipment

# Introduction

## The Origin of Industry and Export in The Eyes of Iranians

The ancient land of Iran has long been the source of knowledge and industry, and Iranians have played a significant role in the development, evolution and promotion of science and human awareness. Most historians of the world believe that most of the advances in science and human civilization are owed to Iranian civilization and the most brilliant works of art and the highest industrial levels has come from the minds of Iranians. Metalworking industries, agricultural industry, pharmacy and alchemy with themes including tile glazing, carpet dyeing, fabrics and glass were some of the industries that were considered by ancient Iranians. In parallel with the special attention to the development of industry, the history of mutual trade relations between Iranians and other civilizations in East and Central Asia, Europe and Africa has a long history, and Iranians have played a significant role in the expansion of global altruism since long ago by being on the route of the Silk Road and maritime trade.

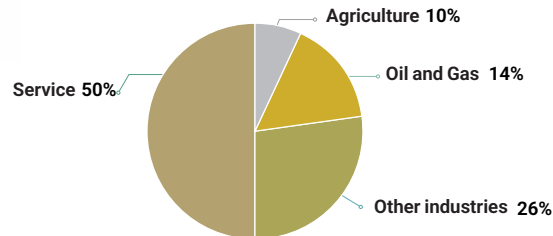
We Iranians today, like our ancestors, consider industry, art and production in our ancient land to be a transformative and constructive place, and we consider the development of technological interactions and the trade of knowledge-based industrial products with other countries as an opportunity for friendship and the expansion of ties.



### Industry and Export in Today's Iran

Industrial development has a very important place in the plans and policies of the Islamic Republic of Iran due to the creation of value added, job creation, increase in exports and reduction in imports, and the transition from an economy dependent on oil and mineral raw materials to an industrial and manufacturing economy, especially an economy dependent on new technologies, is a grand plan that has been adopted for this purpose. Currently, 50% of Iran's gross domestic product is allocated to services and another 50% to industry and manufacturing, which includes 10% agriculture and food industry, 14% oil and gas industry, and 26% other manufacturing industries.

**The Share of Various Activities in Iran's GDP**

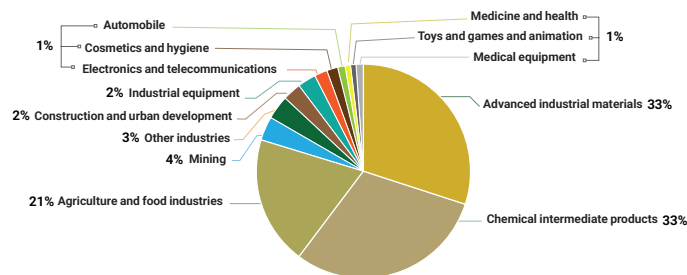


In the meantime, various industries such as pharmaceuticals, medical equipment, construction, communications and telecommunications, energy, mining, chemicals, etc. have a special share of Iran's gross domestic product, and their production, in addition to covering a considerable amount of country's domestic needs, are exported to various destinations.

According to World Customs Organization data, in 2021, the Islamic Republic of Iran had exports equal to 75 billion dollars, almost half of which is allocated to non-oil industries and processed industrial products. Advanced industrial materials, chemical intermediate products, agricultural products and food industry are all among the biggest exporting industries with more exports.

### Iran's Exports in 2021

Ref: Trade Statistics for International Business Development <sup>1</sup>



<sup>1</sup> www.trademap.org

Regarding the main export destinations of Iran, it should be noted that China, India, Indonesia, Russia, Uzbekistan, Ghana, Germany and South Africa, as well as among the regional neighbours, Iraq, Turkey, UAE, Afghanistan, Pakistan, Oman, Turkmenistan, and Azerbaijan account for the largest dollar value of imports from Iran.

### Where the New Technologies Stand in Iran's Industry

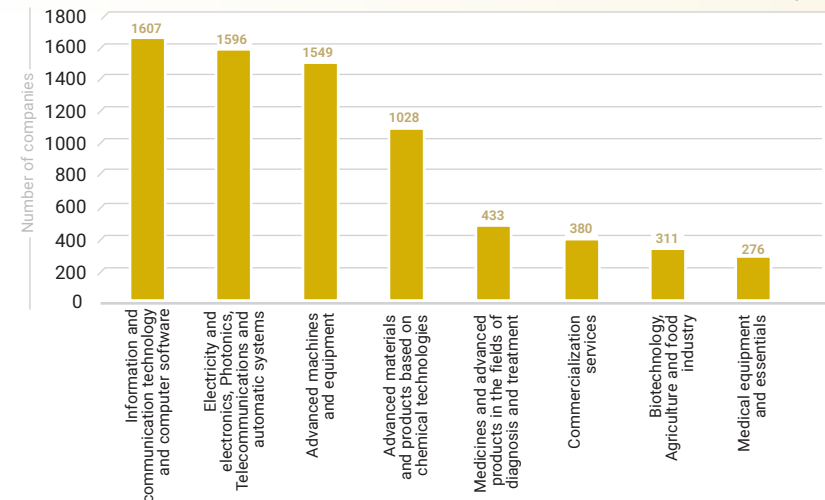
Paying attention to the development of new technologies, commercialization and its influence on manufacturing industries has caused the Islamic Republic of Iran to experience a growing progress in this field in the last decade; An issue that has taken place in Iran in the form of the development of knowledge-based enterprises. Based on this, the meaning behind knowledge-based enterprise is as follows:

A private company that produces products or provides services that have the following three features:

1. The product or service provided by the company has a high or medium to high technology level and its technical knowledge has a significant technical complexity (technology level condition).
2. The product or service design in the company is based on internal research and development or technology transfer (Research and development-based design condition).
3. The company is able to produce and provide the mentioned goods or services to the market (production condition).

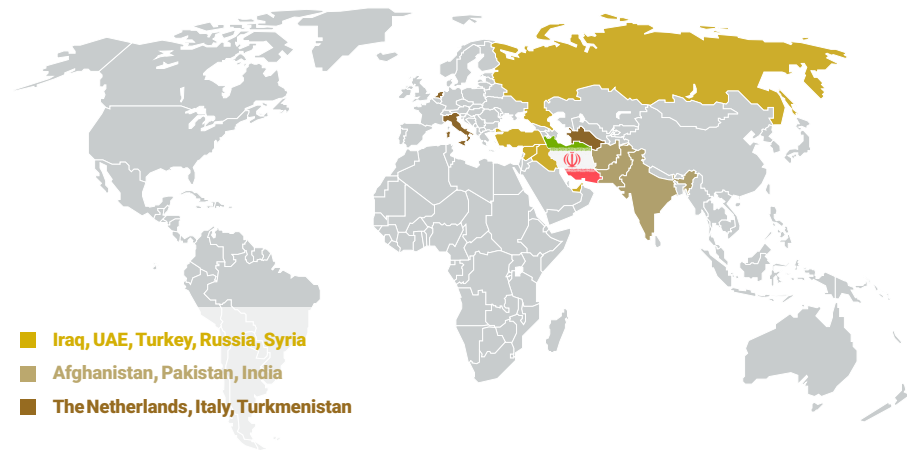
Currently, more than 7 thousand knowledge-based enterprises in Iran are producing products and providing services in the field of various technologies. These companies produce more than 15,000 products or services in total, and their direct employees, which generally include people with a high level of education, are around 250,000 people.

**The Number of Knowledge-Based Companies - Technology Fields**



The export of Iran's knowledge-based enterprises has been growing in the last 5 years, and these companies currently account for about %2 of Iran's non-oil exports.

**The Largest Export Destinations of Iranian Knowledge-Based Enterprises in the Last 5 Years**



**The Status of Knowledge-Based Products in Oil, Gas & Petrochemical**

Oil and gas industries have a special place in the economy of the Islamic Republic of Iran, and the petrochemical industry, as the leader in creating value added in oil and gas resources, has grown significantly in Iran in recent decades. What is of particular interest to Iranian policymakers and managers about these industries is, firstly, the development of equipment and technologies for oil exploration, drilling and extraction by Iranian companies and secondly, the processing of extracted raw materials in order to create added economic value in them.

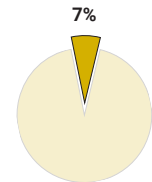
Currently, the oil, gas and petrochemical industries account for a total of %14 of Iran's GDP. Also, every year about half of the total exports of the Islamic Republic of Iran to other countries are related to these industries and they account for about 40 billion dollars worth of exports. It is an issue which the Islamic Republic of Iran is seriously seeking to reduce its dependence on and to avoid selling unprocessed crude oil and raw materials.

Considering the age, volume and high economic value of this industry in Iran, as well as the special focus on related disciplines in many Iranian universities, and finally the many investments aimed at localization of technologies and strategic equipment used in it, this industry makes up a significant volume of the business and production of Iran's

knowledge enterprises. More than 600 Iranian knowledge enterprises that produce and supply more than 1100 technological products are currently active in this industry. These companies also account for more than %12 of Iran's knowledge-based production and employment.

In the end, concerning the export of knowledge-based products of this industry, it is important to note that a total of 390 million dollars worth of products of knowledge enterprises active in the oil, gas and petrochemical industry have been exported outside Iran in the last 5 years.

**The Percentage of Oil, Gas & Petrochemical Companies from All the Knowledge-Based Enterprises**

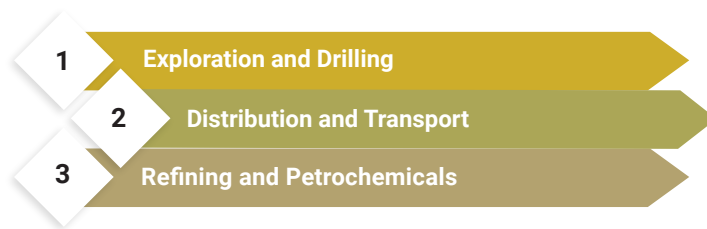


**The Main Export Destinations of Iranian Knowledge-Based Enterprises in the Fields of Oil, Gas & Petrochemical**



## The Division of Knowledge-Based Products in Oil, Gas & Petrochemical

As already stated, the age, volume and high economic value of this industry in Iran, as well as the special focus on related disciplines in many Iranian universities, and finally the many investments aimed at localization of technologies and strategic equipment used in it, have caused this industry to make up a significant amount of business and production of Iran's knowledge enterprises and to produce a wide range of products. In this regard, products have been included in this book that can be divided into the following categories:



The following describes each of the categories and their subcategories in order to provide a general understanding of these areas:

1

### Exploration and Drilling

The oil exploration operation, which begins with the application of geology, leads to the detection and location of oil reservoirs in the underground layers by applying geophysics, petrology, and sedimentology. After that, the most critical and complex stage in oil exploitation, which includes drilling operations, takes place by means of advanced tools and devices. In this category, knowledge-based products produced by Iranian companies related to exploration and drilling have been presented.

- **First Section | Drilling equipment:**

Today, the most common method used in oil well drilling is rotary drilling, and a wide range of equipment is used for this purpose, including wellhead equipment, downhole equipment, and surface equipment. The knowledge-based products of this field, which have been introduced in this book, have the ability to operate in different oil fields up to a service pressure of 15000 psi. In addition, knowledge-based companies have the possibility of providing a variety of drilling services in different working conditions and with different methods (vertical, horizontal).

- **Second Section | Equipment for Enhanced Oil Recovery:**

There are various methods for enhanced oil recovery and various pieces of equipment are used for this purpose. Regarding the most common and up-to-date methods, it is possible to mention the use of multiphase pumps, ESP downhole pumps and SRP wellhead pumps. Most of the knowledge enterprises are capable of manufacturing all the up-to-date equipment in order to perform these processes.

- **Third Section | Separators and Gas Lift Equipment:**

Gas lift is a process to increase fluid flow by artificial means and to extract crude oil from the well by increasing the pressure inside the tank. Gas lift increases the life of the well. Equipment related to gas lift, such as skid mounted equipment, MOT, MOS, etc., are produced by knowledge-based companies, some of which are presented in this book.

*Start chapter at page 22 »*

## 2 Distribution and Transport

The most prominent part of the oil, gas and petrochemical infrastructure and equipment is the existence of a wide network of pipes used to transport oil, gas and various liquids. These transmission pipelines carry gas and oil, liquids and other extracted fluids from the extraction site to the processing site and ultimately to distribution and consumption, and along this path they are fed by rotating equipment such as pumps, turbines and compressors. The products included in this subcategory have the ability to operate in different temperature conditions and pressures and are designed and produced in accordance with various standards approved by the oil industry, including API standards.

*Start chapter at page 44 »*

## 3 Refining and Petrochemicals

The equipment used in the refining and petrochemical industries, which are known as process equipment, have various functions such as storing, flow control, maintaining chemical reactions, etc., and the export potentials and capabilities of knowledge-based companies in this field are presented in this category. Moreover, various consumables used in crude oil refining are discussed in this section:

- **First Section | Catalysts and Chemicals::**

Catalysts are among the most important and key consumer products for the implementation of processes in the oil, gas, petrochemical and chemical industries, and they have an influential position as the processes and final production depend on these products. The catalysts introduced in this book are used in several parts of the midstream and downstream sectors of the oil industry. Due to the presence of catalyst production knowledge and expertise among the companies active in this field, it is also possible to provide products with the technical specifications required by the employer.

- **Second Section | Tanks, Towers and Reactors:**

This subcategory includes tanks used in the oil, gas and petrochemical industry that are mainly used in various industries for storage in the desired maintenance conditions. Depending on the temperature and working pressure of the stored fluid, these tanks are made of different materials, including steel, composite, double-wall concrete tanks, etc. Towers are mainly cylindrical tanks that are used to distill raw materials and produce materials such as gasoline, gas, oil, bitumen, etc. These products work in different temperature and working conditions and are made in different capacities.

- **Third Section | Control Systems and Instrumentation Equipment:**

Control systems and instrumentation are used in the oil, gas and petrochemical industries to control and monitor various conditions. Control of temperature, pressure and level of fluids in process facilities, oil refining, petrochemical facilities, oil and gas pipelines and distribution process, control of presence of flammable gases during production, monitoring of pollutant emission are carried out by instrumentation equipment in the oil industry. The main control infrastructures used in monitoring the condition and process control of different parts of the oil industry are presented in this section.

- **Fourth Section | Boilers, Heat Exchangers and Burners:**

In the oil industry, boilers are used to transfer the heat released by fuel combustion, heat exchangers are used to control heat, and burners are used to generate heat. In this book, the capabilities of knowledge enterprises in production of all kinds of products needed in this area, including shell and tube heat exchangers, plate heat exchangers, multi-stream cryogenic exchangers, etc., are presented.

- **Fifth Section | Valves and Actuators:**

A valve as a device used to control the flow and pressure of fluids, in the petrochemical industry has applications such as cutting and controlling the flow of liquids and gases, regulating the passage of the required amount of liquids and gases, preventing the return of passed liquids and gases, regulation and control of the amount and pressure of liquids, control and safe keeping of pressurized devices. In this regard, the provided valves have different work classes and different sizes and the ability to operate in different temperature and pressure conditions.

- **Sixth Section | Metering:**

The metering system is specifically used in the oil, gas and petrochemical industry to measure the volume or mass of fluids (gas, liquid or two-phase state). The metering devices introduced in this book are available in different models, such as turbine, ultrasonic, etc., and are presented with different measurement accuracies in different temperature and pressure conditions.

*Start chapter at page 74 »*

# Oil, Gas & Petrochemical

## First Chapter Exploration and Drilling

- Drilling Equipment
- Equipment for Enhanced Oil Recovery
- Separators and Gas Lift Equipment



## Second Chapter Distribution and Transport



- Rotating Equipment (Pumps, Turbines & Compressors)

## Third Chapter Refining and Petrochemicals

- Catalysts and Chemicals
- Tanks, Towers and Reactors
- Control Systems and Instrumentation Equipment
- Boilers, Heat Exchangers and Burners
- Valves and Actuators
- Metering



First Chapter

# Exploration & Drilling



# FIRST CHAPTER

FIRST CHAPTER

Second Chapter

Third Chapter

## Exploration & Drilling

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Sections

Drilling Equipment

Equipment for Enhanced Oil Recovery

Separators and Gas Lift Equipment





## ➤ Liner Hanger

🏠 Hamrah Poushesh Oil and Gas Engineering Services Co. [www.hpogc.com](http://www.hpogc.com)



### Product Introduction:

The product is a device to hang the lining pipes of gas and oil wells using the built-in slips sinking into the body of the wall pipe with the previous lining. The pipes are fully in contact with the wall, provided that the proper weight is applied. The product is offered in various models, depending on the temperature, pressure, and deviation of the well. The product is installed mechanically or hydraulically. Liner hanger strings are composed of numerous components, the most important of which are liner hangers and packers. The main components of a rotational hydraulic liner hanger are:

- ※ Mandrel made of steel with the strength equal or higher than the liner
- ※ Hydraulic cylinder which is the main component of the hydraulic section
- ※ Case and Slips which is responsible for hanging the liner
- ※ Thrust bearing that enables the liner hangers to rotate during cementation

**Founded:**

1995

### Application:

- ※ Hanging the liner at the determined position
- ※ Cementation of horizontal or inclined wells
- ※ Sealing the liner edge

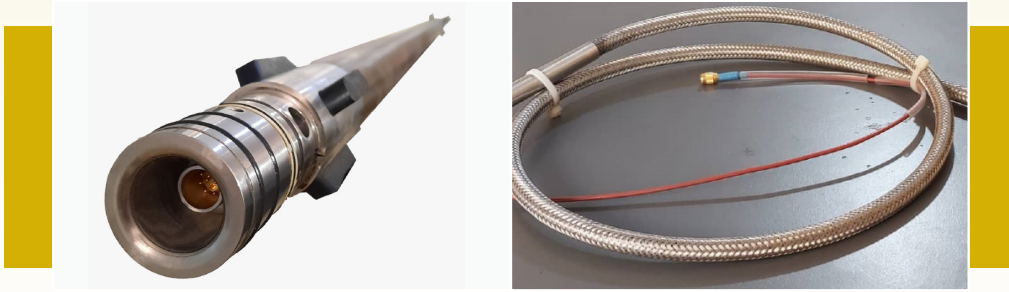
*This product is final B2B equipment.*

### Technical Specifications:

|                             |                              |
|-----------------------------|------------------------------|
| <b>Outer liner diameter</b> | Usually 5 and 7 in.          |
| <b>Liner Steel Material</b> | L80/P110/C110                |
| <b>Liner Joint Threads</b>  | New VAM/VAM Top/BTC          |
| <b>Installation Method</b>  | Mechanical set/Hydraulic set |
| <b>Rotational Type</b>      | Rotating/Non-rotating type   |

### International Standards or Permission:

- ※ TUV International Group
- ※ Management (IMS Systems)
- ※ TUV International Group (ISO 9001 -2008)
- ※ TUV International Group (OHSAS 18001:2007)
- ※ TUV International Group (ISO 14001 -2004)
- ※ TUV International Group (ISO/TS 29001:2010)
- ※ ASTM-based domestic standards
- ※ API 11D-based domestic standrads



## ➤ MWD-Gamma Directional Drilling Equipment

### 🏠 Raya Energy Engineering and Instrumentation Co. (REEICo)

www.reeico.com



#### Product Introduction:

The MWD system in drilling has the task of receiving information about the position and direction of the BHA in the well without interfering with other drilling processes. This system is equipped with sensors that measure the inclination and azimuth of the drilling path and the well's natural gamma. These sensors transmit a large amount of data to the surface through drilling mud. The data transferred to the surface is decoded and presented in number and graph format. The data transmission system of MWD sensors, which is done without cables and electrical connections, is known as Telemetry Pulse Mud. The speed of receiving information from the MWD system and reducing wasting time are among this system's most essential advantages. The construction of such a system is associated with many complications, which require up-to-date knowledge and considerable technical abilities.

Today, due to various technical and economic reasons, the drilling of vertical wells is reduced, and more than eighty percent of production wells are developed from directional or horizontal drilling methods. This statistic increases to almost 100% of wells in offshore wells.

To drill directional/horizontal wells, the following parameters should be measured by downhole tools:

- \* Angle of deviation from the vertical line (Measurement While Drilling)
- \* The angle of deviation from the north direction (Measurement While Drilling)
- \* Reading the constructive resistance around the well being drilled (Logging While Drilling)

**Founded:**

2016

\* Reading of gamma rays in the rock while drilling (Logging While Drilling)  
 This equipment is an interdisciplinary tool and is a complex and profound combination of the knowledge of electronic engineering and precise instruments, mechanical engineering, software engineering, and nuclear physics. For this reason, despite its demand in more than 80 countries of the world and very high annual financial demand, only three countries (America, England, and China) possess the essential and basic knowledge.

#### Application:

- \* Measuring the well path during drilling
- \* Planning the drilling route map
- \* Measuring the natural gamma of the well

*This product is final B2B equipment.*

#### Technical Specifications:

|                           |   |
|---------------------------|---|
| <b>Azimuth</b>            | 0-360° (± 0.5° Accuracy)  |
| <b>Inclination</b>        | 0-180° (± 0.05° Accuracy)   |
| <b>Tool Face</b>          | 0-360° (± 0.2° Accuracy)  |
| <b>Magnetic Field</b>     | ± 200ut or ± 2000 mGauss<br>(± 0.003Ut or ± 0.03 mGauss Accuracy)           |
| <b>Temperature</b>        | -20°C to 150°C continuous within specifications<br>-40°C to 200°C survival  |
| <b>Shock</b>              | 900 g peak, 0.5ms halfsine(-40° to 185°C)                                   |
| <b>Vibration</b>          | 30 g sine sweep 50-2000 Hz (-40 to 185°C)<br>20 g RMS 5 - 1000 Hz, 0.432/Hz |
| <b>Power Requirements</b> | ± 15vdc nominal @ 70 ma max<br>± (12 - 18 vdc) min/max                      |

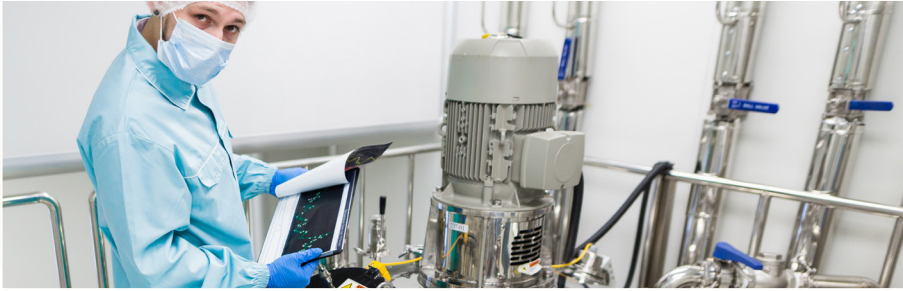
**Warm-Up Time Operate to Specifications within 1.5 seconds after power up**

#### Advantages:

- \* Use of high-tech parts
- \* Very low noise electronic design
- \* Use of thermal compensation and temperature calibration methods in order to increase the stability and resistance of the system against thermal drift

#### International Standards or Permission:

- \* Iranian Central Oil Fields Company approval
- \* NACE
- \* 883 Standard



## ➤ PLT (Production Logging Test Equipment)

🏠 Nasim Hamrah Communication Industry Co.

[www.nhi.ir](http://www.nhi.ir)



### Product Introduction:

Production logging tests are a group of well logging methods driven into a completed injection or production well to evaluate and behavior and performance of the fluid in and around the well. Contrary to logs evaluation formation charts which deal with the reservoir rock and frequently used to determine parameters such as porosity, saturation, damage radius, producing section thickness, and formation lithology, PLTs assess the flow inside and outside the production tube, or even how the well is completed. A series of devices, including CCL, CFB, and CFBE are requires to achieve PLTs. These devices enable PLTs by interaction with each other.

**Founded:**

1997

### Application:

Assessing the behavior and performance of the fluid inside and round a well

*This product is final B2B equipment.*

### Technical Specifications:

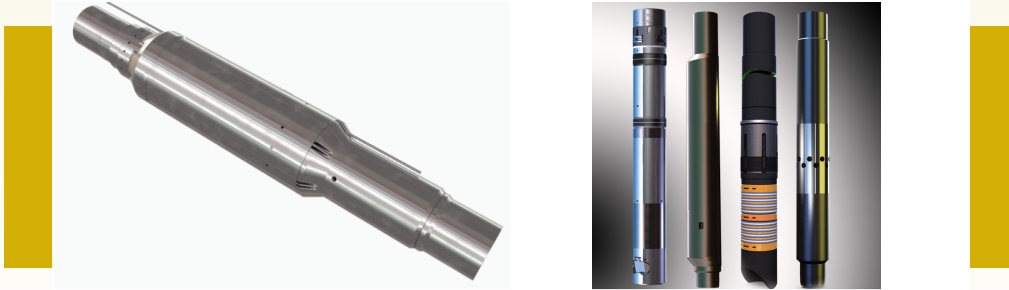
- \* Designing and implementing analog and digital electrical circuits for signal processing in very high temperatures (177°C)
- \* Designing PCB for performing at very high temperatures (177°C)
- \* Designing and manufacturing high-temperature magnetic sensors
- \* Designing and implementing data sending, receiving, and feed provision protocols on one shared wire with other devices
- \* Small design for PCB inside a pipe with a diameter of 26 mm
- \* Low power consuming circuits to reduce the heat generation and replacing power supplies with batteries
- \* Design based on using the minimum elements to minimize device failure during operation
- \* Designing and manufacturing mechanical parts to seal the device housing against 20,000 psi fluid pressure
- \* Designing and choosing the proper alloy for device housing to resist H<sub>2</sub>S and other downhole chemical corrosives under high temperature and pressure
- \* Designing and choosing the proper alloy for electrical conductivity of the device body as the earth signal
- \* Coating device threads to prevent galling while considering the body conductivity
- \* Designing and implementing the second layer sealing to increase the safety factor
- \* Designing and choosing the proper alloy with suitable magnetic permeability due to the presence of magnetic sensors

### Advantages:

Establishing qualification and finalization standards before field operations by the company and adhering to these standards

### International Standards or Permission:

- \* HPHT test
- \* Shock and vibration test



## ➤ Downhole Completion String with Pressure of 10000 psi

Arvand Development Co.

[www.kheradsanat.com](http://www.kheradsanat.com)



### Product Introduction:

The downhole completion string includes more than ten parts and a set of tools and equipment to control the fluid flow, which in total leads to safe and controlled extraction from the drilled wells. In the design of each type of equipment, it is very important to pay attention to many issues such as corrosion, wear, and mechanical resistance. In addition, each of these parts has its own performance mechanisms, the design of each of which is very complex based on different performance conditions, including work pressure.

The main components of this product are:

- \* Packing Barrel
- \* Chock
- \* Flow Tube
- \* Flapper
- \* Flapper Spring
- \* Spring Housing
- \* Spring
- \* Lock Adapter
- \* Flapper: Housing & Pin & Poppet
- \* Redress Kit

**Founded:**

2007

### Application:

Use in drilled wells to prevent eruption

*This product is final B2B equipment.*

### Technical Specifications:

|   |  |
|---|--|
| Working Pressure                        | 10,000 psi   |
| Working Temperature                     | 280°F  |
| Opening Pressure                        | 1000 psi   |
| Closing Pressure                        | 600 psi  |
| Size                                    | 5" X 3.813"  |
| Od                                      | 3.813"   |
| Max Od (Packing)                        | 3.813"   |
| Min Id                                  | 2.125"   |
| Length                                  | 52"  |
| Max. Setting Depth                      | 100 FT   |
| Material & Arrangement of Seal Elements | Remark 3   |
| Material                                | L-80 TYPE III 13CR H2S SERVICE AS PER API 5CT & NACE SPECS. MR-01-75 |

**International Standards or Permission:**

API 14A



## Wellhead Gate Valves with API Standards

Behsazan Jonoob Co.

www.bjrng.ir



### Product Introduction:

A gate valve is an industrial type used to open and close the fluid flow in a pipeline. The valve is opened or closed by the vertical movement of the disc on the seat. In the gate or slide valve (Gate Valve), a circular or rectangular valve is used to open and close the fluid flow path. These valves cannot adjust the flow and are placed in the category of shut-off valves. Gate valves can be THROUGH-CONDUIT, WEDGE, and KNIFE. The main parts of the gate valve include the Seat, Disk, Stem, Bonnet, Body, and non-metallic components. Types of API6D gate or sliding valves are:

- \* Class 150 from 24 inches and above
- \* Class 300 from 20 inches and above
- \* Class 600 from 16 inches and above
- \* Class 900 from 6 inches and above
- \* Class 1500 and 2500, all sizes
- \* API6A valves of all sizes

**Founded:**

1995

### Application:

- \* In petrochemical industries
- \* Blocking the flow path in pipelines-wellhead

*This product is final B2B equipment.*

### Technical Specifications:

|                                 |   |
|---------------------------------|---|
| <b>Characteristics</b>          | API 6A, API 6D, ASME B16.5, ASME B16.10, ASME B16.34, ASME Sec (VIII, IX, X), ASTM, API 600, API 602, BS 5352 |
| <b>Normal sizes</b>             | 21.16", 41.16", 71.16", 9", 11"   |
| <b>Ranking</b>                  | #3000, #5000 and #10000   |
| <b>Temperature rating</b>       | T, U, V   |
| <b>Materials</b>                | 45K, 60K, 75K   |
| <b>Material Class</b>           | AA, BB, CC, DD, EE, FF  |
| <b>Body and Bonnet Material</b> | FORGED AISI 4130, AISI 410, A694  |
| <b>Trim Material</b>            | 4130/F6A+TC/ENP   |
| <b>Operator</b>                 | HANDWHEEL, GEAR, HYDRAULIC (SSV)  |
| <b>Service</b>                  | OIL, GAS  |

### Advantages:

- \* Full calculations related to the spring behind the seats (tension analysis, static and dynamic force analysis)
- \* Stem calculations (torque, pitch, external diameter, and root diameter)
- \* Calculation of the force and tension caused by the impact of the wind on the body of the valve

### International Standards or Permission:

- \* API 598
- \* ISO 5208
- \* BS 6755-1
- \* API 6A



## ➤ Gate Valves Up to Class 2500

🏠 Petro Tajhiz Sepahan Co.

[www.ptsbrand.com](http://www.ptsbrand.com)



### Product Introduction:

A gate or slide valve is an industrial valve used to open and close the fluid flow path in the oil and gas industry. These valves cannot adjust the flow and are placed in the category of shut-off valves. The gate valve has a gate plate with a rectangular or circular cross-section, and a circular hole the size of the valve inlet has been created on its surface.

This group of products includes gate valves in Wedge Gate Valve, Through Conduit Gate Valve, and Knife Gate Valve types.

Wedge Gate Valve, which is usually used in the path of liquid fluids (water, oil, etc.), is produced in the following types:

- \* Class 150 in sizes 2.1" to 32".
- \* Class 300 in sizes 2.1" to 10".
- \* Class 600 in sizes 2.1" to 6".
- \* Class 800 in sizes 2.1" to 1".
- \* Class 1500 in 4.3" to 3" sizes

"Through Conduit Gate Valve" which is most commonly used in transmission pipelines and can pass pellets (pig run), is produced in 8" class 600 size.

Knife Gate Valve, which has a minimal face-to-face distance and occupies little space, is produced in 36" and 48" class 150 sizes.

**Founded:**

2008

### Application:

- \* Complete disconnection and connection of the current
- \* Preventing the return of passed liquids and gases
- \* Adjusting the passage of the required amount of liquids and gases
- \* Adjusting and controlling the amount and pressure of liquids and gases
- \* Controlling and keeping pressure devices safe

*This product is final B2B equipment.*

### Technical Specifications:

| Size          | Class       | Other Specifications   |
|---------------|-------------|--|
| 1.2 " to 40 " | 150 to 2500 | Rising or Non-Rising Stem<br>Pressure Seal, Bolted or Welded Bonnet<br>Solid or Flexible Wedge<br>NACE MR 0175 |

### International Standards or Permission:

- \* API 600
- \* ISO 15761
- \* API 602
- \* ASME B16.34
- \* API6D



**Application:**

- ※ Maintaining and increasing production of oil wells and artificial production of oil wells
- ※ On so-called dead oil wells (with zero wellhead pressure) or wells with low production to increase oil production up to 3000 barrels per day

➤ **Intelligent Sucker Rod Pump (SRP)**

🏠 Faraz Novin Andish Arvand Co.

AbyaranMAG

**Product Introduction:**

The pumps used for gas lift include three types: Sucker rod pumping, ESP: Electrical Submersible Pump, and PCP: Progressing Cavity Pump, among which SRP sucker rod pumps have the largest share of production in the field of artificial submersible pumping.

This pump is the first method of artificial lift techniques used in oil fields, and it is the most widely used pump in oil wells in the world. This type of pump is the advanced generation of horse head pumps and has been used for over 40 years.

Oil recovery with these pumps depends on various factors such as rock and reservoir fluid properties, reservoir phase behavior, reservoir temperature, the fluid level in the well, and the pump's performance. Each well needs its internal pump, and you cannot use one of them in all conditions. You can expect production if you have accurate reservoir information, proper calculation, and accurate pump selection.

Rod pumps are suckers. The new generation of rod-sucker pumps is designed for the secondary recovery of heavy and semi-heavy oil. Due to the movement of the hammer, these pumps travel a short course, with a course between 6 and 10 meters; it is possible to produce oil from wells with an average depth of 3000 to 4500 meters and a discharge rate of about 800 barrels per day. The function of these pumps is that by creating suction inside the well column, they cause a pressure difference and drain the oil from the well. These types of pumps are suitable for use in wells with a low well closed pressure, and their use in wells with a natural production higher than 2000 barrels per day is not recommended.

**Annual Production Capacity:**  
12 collection

**Founded:**  
2014

*This product is final B2B equipment.*

**Technical Specifications:**

|  |  |
|--|--|
| <b>Temperature and pressure conditions of electrical parts</b> | Because this equipment is installed on an oil well, all electrical equipment installed on the site must be explosion-proof (Ex-Proof) and suitable for outdoor environments with harsh conditions (high IP rating) and high ambient temperature (60 degrees Celsius). The pressure class of measuring instruments is 1500 psi.   |
| <b>Temperature and pressure conditions of mechanical parts</b> | <ul style="list-style-type: none"> <li>※ <b>String in the well:</b> depending on the conditions in the well, usually pressure up to 2500 psi and temperature up to 180°C</li> <li>※ <b>Well valves:</b> working pressure 5000 psi and temperature class U (-18°C to +121°C)</li> <li>※ <b>Hydraulic actuator system:</b> 1500 psi working pressure and ambient temperature (60°C)</li> <li>※ <b>Power supply system and ground surface pump equipment:</b> pressure and ambient temperature (Outdoor)</li> </ul> |

**Advantages:**

- ※ Lower price than similar products
- ※ Ability to customize
- ※ Providing complete package along with installation and maintenance services
- ※ Proximity to the countries of the region compared to the United States, China and Russia

**International Standards or Permission:**

API 11E



## ➤ MOT (Mobile Oil Treatment) Unit

🏠 Amin Sazeh Sorena Petroleum Industries Co.

www.apiss.ir



### Product Introduction:

This device includes various equipment needed for oil well processing, such as a separator, sand remover, descaler, oscillatory tank, oil transfer pump, information gathering system, laboratory, chemical injection pumps, air supply set, nitrogen capsules, power generator, etc. has been present on the well in various operations of drilling, exploitation, and repair of oil wells. The oil containing impurities and pollution is purified and refined after passing through this device and is pumped to factories and exploitation stations through pipelines. It is worth mentioning that this device records real-time oil production data, based on which the employer can determine when to disconnect this complex from the circuit and use permanent equipment for oil extraction.

### International Standards or Permission:

- \* ASME VIII Div1. ANSI B31.3, NACE MR-01-75 for DESANDER
- \* ASME VIII Division 1/ASME B31.3 / NACE MR 0175 / DNV2.7-3 for TEST SEPARATOR
- \* ASME VIII Div1, ANSI B31.3, NACE MR-01-75 for DESILTER
- \* ASME VIII Division I/ ASME B31.3 /NACE MR0175 for Double Surge Tank

**Annual Production Capacity:**

4 Machines

**Founded:**

2016

### Application:

- \* Prevent burning swage oil, to control carbon foot print, air pollution & acting through global warming policies

*This product is final B2B equipment.*

### Technical Specifications:

| ITEM                       | Parameter               | Description  |
|----------------------------|-------------------------|--|
| Safety Equipment           | SSV                     | Brand: Cameron Type: Gate Valve Size: 3 to 1.16" Working Pressure: 10,000 Psi  |
|                            | ESD                     | Hydraulic Working Pressure: 6,000 Psi Air Supply Pressure: 120 Psi Safety Output Pressure: @3,500 Psi  |
| Desander                   | Cyclone Desander        | Design Code: ASME V111 Div1. ANSI B31.3, NACE MR-01-75 Design Pressure: 1440 Psi Vessel size: 620mm x 2,000mm Capabilities: Gas 42 MMSCFD, Liquid 14,000BPD, Sand  |
| Test Separator             | 3-Phase Test Separator  | Working Medium: Crude oil, Water, Natural Gas Operating pressure/Design Pressure: 1,000 psi Operating Temperature/ Design Temperature: -19°C to 70°C Liquid Capacity: 14,000BPD Gas Capacity: 42MMSCFD   |
| Desilter                   | Cyclone Desilter        | Configuration: Horizontal Design Code: ASME V111 Div1. ANSI B31.3, NACE MR-01-75 Design Pressure: 1,000 Psi Vessel size: 620mm x 1,000mm Capabilities: Gas 5 MMSCFD, Liquid 7,500BPD, Sand   |
| Surge Tank                 | Double surge Tank       | Model: 100" x 150psi 75bbl Surge Tank Type: Vertical Design Pressure: 150psi (1.05MPa), 1 Class Pressure Vessel Diameter of Vessel: 100 (2,550mm) (ID) Length of Vessel S/S: 3,200mm Volume of Vessel: 75bbl   |
| Transfer Pump              | Booster Pump            | Model: Horizontal Centrifugal Code: API 610 Medium: Crude Oil Discharge Pressure: 100psi Flow Rate: 3,000 bbl./day Electric Motor: ABB   |
| Data Gathering             | Data Acquisition System | Sampling Accuracy: 16 bit Barriers: Pupperl + Fuchs Modules: Advantech/IPC Sampling Rate: 10 Sample Per Second Digital Filtering System: Ability of filter type definition (FIR, LPF, FIR BPF)   |
| Chemical Injection Package | Chemical Injection Pump | Maximum Flow Rate: 15 L/min Maximum Injection Pressure: 6000 psi Air Head: Double Applications: Pressure Testing, Polymer Fluids Injection, Corrosion Inhibitor Injection, Solvent Injection, Organic Fluid Injection, Conventional Fluids Injection |
| Air Package                | Compressor              | Volume Flow (by pressure of 10 bar): 5.72 m <sup>3</sup> /min Volume Flow (by pressure of 13 bar): 5.04 m <sup>3</sup> /min Rated Motor Power: 37 kW   |

### Advantages:

Reduction of environmental problems after drilling, exploitation, and repair operations.





## ➤ Mobile Oil Treater (MOT)

🏠 Saban Sanat Sepahan Co.

[www.sabansanat.com](http://www.sabansanat.com)



### Product Introduction:

Mobile oil treater and separator is a collection of three-phase separation processes that is installed on several trailers and can separate water, gas, sand, and gravel from crude oil. Based on the customer's needs (according to the quality and nature of the well oil), the number and type of the installed equipment can be different. The trailers are designed in a way that they can be transferred, installed, and set up at the shortest possible time without any traffic limitations. The collection includes all the equipment needed for controlling the process, holding the operators, and transferring the treated oil. The current products are designed with two goals in mind:

- ※ Separating water, salt, gas, and solid particles from oil to achieve high purity
- ※ Complete neutralization of the acid in oil and separating free water, gas, and solid particles

**Founded:**

2007

### Application:

- ※ Preventing crude oil loss and burning the oil of the wells with not enough pressure and flow rate to reach the plant due to various reasons
- ※ Under drilling wells (drilling rigs) and operational regions under early production
- ※ Testing to determine the crude oil properties for a recently operating well
- ※ Under repair and acidification wells in operating regions
- ※ Operating salty wells

*This product is final B2B equipment.*

### Technical Specifications:

|  |   |
|--|---|
| <b>Input Flow Intensity to the Unit</b>        | 500-3000 bbl/day. For light crude oil maximum flow rate is 1600 bbl/day |
| <b>Wellhead Flow Pressure</b>                  | 50-3000 psi   |
| <b>Oil API</b>                                 | 24-40   |
| <b>Temperature of Input Oil</b>                | 90-180 Kelvin   |
| <b>Gas Oil Ratio (GOR)</b>                     | 250-2500 scf/b  |
| <b>Sulfur Content</b>                          | 1.5-3 scf/bbl   |
| <b>H2S content</b>                             | 0.3 Wt%Oil  |
| <b>Viscosity in 40 °C</b>                      | 2.78-25 °C  |
| <b>The Maximum of Salt in production water</b> | 50000-250000 ppm  |
| <b>Sand Flow Intensity</b>                     | 3000 ppm/v  |
| <b>Separation of sand particles</b>            | greater than 10 microns   |
| <b>Bs&amp;w content in package output</b>      | maximum 0.3-0.8 percent   |
| <b>Output Oil Pressure from the package</b>    | up to 1000 psi  |

### International Standards or Permission:

- ※ Aghajari Gas and Oil Co. Confirmation
- ※ Gachsaran Oil and Gas Production Co. Confirmation
- ※ National Iranian South Oil Company Confirmation

Second Chapter  
**Distribution & Transport**



# SECOND CHAPTER

First Chapter

**Second** CHAPTER

Third Chapter

## Distribution & Transport

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## ➤ API Centrifugal Pumps

### ⬆ Heavy Duty Pumps and Water Turbine Mfg Co.

[www.pumpturbine.ir](http://www.pumpturbine.ir)



#### Product Introduction:

Centrifugal Pumps are mechanical devices to transfer liquids. They transfer the liquid to a higher location (increasing head) or even downstream (usually pools or tanks) by enhancing the liquid pressure. Different standards have been established for the long-term operation of pumps and equipment in the oil and gas industry. These standards are designed for long-term performance and the easiest way and shortest time for maintenance. Pump manufacturing requires different expertise, including metallurgy (material selection), fluids (pump design), and mechanics (production process design, machining). The pump design is an expensive and time-consuming process. Therefore, a huge part of the final price is related to the design. This causes the price of available API pumps to be as high as twice the prime cost.

**Founded:**

1992

#### Application:

- ※ Refineries and crude oil transmission stations
- ※ Feed water pumps as boiler pumps in power plants

*This product is final B2B equipment.*

#### Technical Specifications:

| Model      | Power | Fluid       | RPM   | Flow Rate (m3/h) | Head (m) |
|------------|-------|-------------|-------|------------------|----------|
| BS3 3×7    | 150   | Crude oil   | 2,950 | 70               | 406      |
| HMF1-60.70 | 200   | Raw water   | 745   | 3,375            | 15.3     |
| BS3-3×8    | 75    | Spray water | 2,980 | 20               | 560      |

#### Advantages:

- ※ Designing, manufacturing, installing and setting up the pumps by the company
- ※ Lower price than similar products

#### International Standards or Permission:

- ※ API610



**Application:**

|   |  |
|---|--|
| <b>NON API pumps with power between 30 to 149 kW</b>        | <ul style="list-style-type: none"> <li>* Water transfer for agricultural, urban and industrial purposes</li> <li>* Transfer of hot water for heating and cooling facilities</li> </ul> |
| <b>NON API pumps with a shaft power of 150 kW and above</b> | <ul style="list-style-type: none"> <li>* Drinking water supply, industrial processes</li> <li>* Water supply pumping station, power plants and...</li> </ul>                           |

➤ **API Centrifugal Pumps**

🏠 Pumpiran Co.

[www.pupmiran.com](http://www.pupmiran.com)



**Product Introduction:**

The NON API pumps include different centrifugal pumps, multistage pumps, double suction, etc., with varying axes of power. These pumps are designed and manufactured based on ISO 9908 or ISO 5199 standards. This group of pumps is divided into the following two categories based on power:

- NON API pumps with shaft power between 30 and 149 kW
- NON API pumps with a shaft power of 150 kW and above

**Annual Production Capacity:**  
30 pumps

**Main Export Destinations:**  
Tanzania, Armenia, Sudan, Iraq, Syria

**Founded:**  
1995

*This product is final B2B equipment.*

**Technical Specifications:**

|  | Centrifugal Pumps |            | Multistage Pumps |            | Double Suction Pumps |            |
|--|-------------------|------------|------------------|------------|----------------------|------------|
|  | Capacity (m³/h)   | Height (m) | Capacity (m³/h)  | Height (m) | Capacity (m³/h)      | Height (m) |
| NON API pumps with power between 30 to 149 kW        | 5-1800            | 5-90       | 2-440            | to 700     | to 4500              | to 130     |
| NON API pumps with a shaft power of 150 kW and above | 5-1800            | 5-90       | to 1200          | to 510     | to 9000              | to 260     |

**Advantages:**

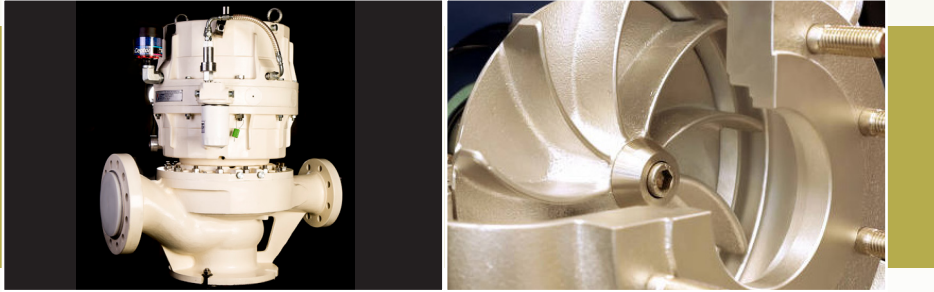
- \* High Quality
- \* Fair Price
- \* Wide range of after-sales services
- \* Easy supply of spare parts

**International Standards or Permission:**

- \* ISO 9908
- \* ISO 5199

**Application:**

Petrochemical industries, refineries, power plants



## ➤ API Centrifugal Pumps

with Speed more than 15000 rpm and Spare Parts

### ◆ Kavosh Sanat Toos Co.

www.kstc.ir

**Product Introduction:**

OH6 pumps are high-speed API pumps that can provide significant heads and high pressures that other types of OH cannot produce. The main reason is the high impeller speed of these pumps, between 12,000-35,000 rpm, created through the integrated booster gearbox in the pump structure. This gearbox allows the pump in Off design conditions (higher or lower than the rated state) by controlling the speed of the electric motor. One of the features of this type of pump compared to other centrifugal pumps is the possibility of using a single-stage pump instead of using multi-stage pumps or several pumps in a series. This makes it possible to reduce the cost of repairs and maintenance in addition to reducing the footprint of the equipment. Another feature of these pumps is the possibility of using them in situations where the positive height head of the sucker pump is very low. It is worth mentioning that about 1-2% are of this type among the electro pumps of a petrochemical complex. These pumps are mainly delivered to customers as skids.

This product is used for transferring, injecting, and storing all process fluids, including volatile, corrosive, toxic and flammable, acidic, slurry, etc., in different temperature ranges.

**Annual Production Capacity:**

50 pumps

**Main Export Destinations:**

Indonesia, Malaysia, Thailand, Iraq, Russia

**Export History:**

Up to 500,000 \$

**Founded:**

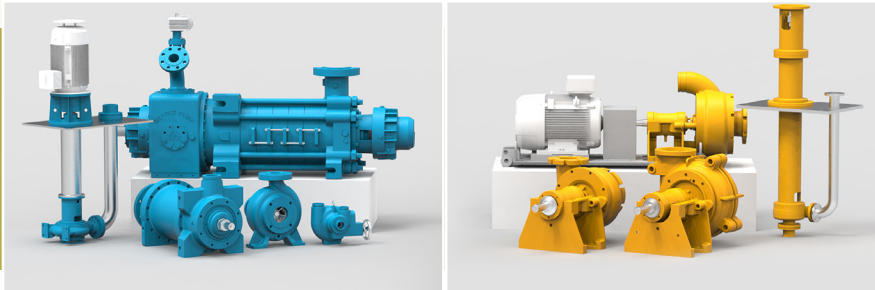
1995

*This product is final B2B equipment.***Technical Specifications:**

| Features           | Detailed descriptions   |
|--------------------|---|
| <b>Material</b>    | According to the process fluid and its physical and chemical characteristics, the material of the main parts, such as equipment casing, shaft, impeller, etc., is selected under the API 610 standard and other international standards, and the experiences that are gathered in this context.<br>Different material groups, such as carbon steel, stainless steel, super duplex alloys, and titanium, are used according to process conditions. |
| <b>Physical</b>    | These pumps can be installed in vertical and horizontal positions.  |
| <b>Mechanical</b>  | The speed of this equipment can reach up to 26000 rpm   |
| <b>Electrical</b>  | Electric and electronic parts include the main engine as rotating equipment, auxiliary oil pump engine, and precise and control equipment. The electric power of the main engine varies from below 10 kW to several megawatts depending on the performance characteristics of the equipment.  |
| <b>Dimensional</b> | The main equipment is designed and manufactured in different sizes of inlet and outlet nozzles and working pressures according to the process conditions.   |

**International Standards or Permission:**

- \* API 610 standard regarding the design, manufacture, and testing of centrifugal pumps in oil, gas, and petrochemical industries
- \* ISO 9906 standard in hydraulic testing of rotary pumps
- \* API 614 and api 682 standards regarding oil systems, sealing systems, and auxiliary systems
- \* API 613 standard regarding the design, manufacture, and testing of special gearboxes in the oil, gas, and petrochemical industries
- \* ASME b31.3 standard regarding piping
- \* API 671 standard regarding special couplings in oil, gas, and petrochemical industries



**Application:**

Transfer of chemical and acidic materials, injection and desalination plants

➤ **API Centrifugal Pumps**

➤ Behriz Pump Sama Co.

[www.behrizpump.com](http://www.behrizpump.com)



**Product Introduction:**

Centrifugal multistage pumps for producing pressure up to 70 bar are made of corrosion-resistant material and high mechanical strength (types of steel alloys, including stainless steel 316, 316L, DUPLEX, etc.). These pumps are equipped with a mechanical seal and hydraulic force balance mechanism (drum balance and disk balance) and are used in the transfer, injection, and desalination plants.

**Annual Production Capacity:**

24 pumps

**Founded:**

2007

*This product is final B2B equipment.*

**Technical Specifications:**

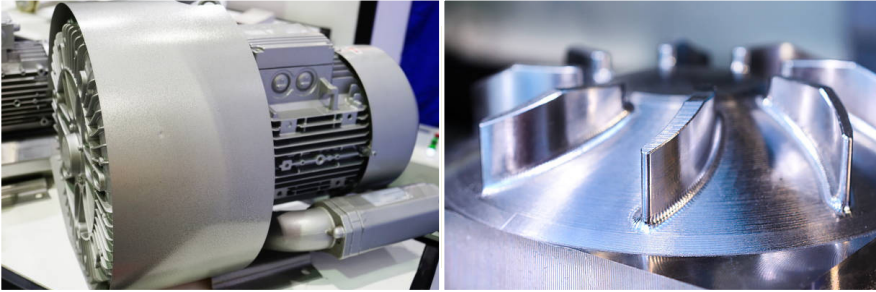
|                             |                                    |
|-----------------------------|------------------------------------|
| <b>Servicing</b>            | Sea Water Pump<br>Process Pump     |
| <b>Engine Power (kW)</b>    | Process Pump                       |
| <b>Pump Speed (rpm)</b>     | From 100 to 600                    |
| <b>Parts Material Class</b> | 3000                               |
| <b>Parts Material Class</b> | S.S316 + S.S316L + Duplex + %12 Cr |

**Advantages:**

- \* There is no similar product in Iran.
- \* The after-sales service and the final price are lower than similar products manufactured outside Iran.
- \* It is localized according to the needs of Iranian industries.

**International Standards or Permission:**

- \* 610 API
- \* DIN
- \* ISO1940



## ➤ API Centrifugal Pumps

Type BB1 and Pressure of 300 bar

🏠 Petro Rahan Pump Co.

[www.petrorahanpump.ir](http://www.petrorahanpump.ir)



### Product Introduction:

Centrifugal pumps, including dynamic pumps in which energy is transferred to the fluid by turning a propeller, can carry the fluid upwards against the earth's gravity. The transfer of energy from a rotating propeller to the fluid to produce pressure and fluid movement is always described as the centrifugal force in fluids.

Centrifugal pumps are the industry's most widely used type of water pump. Since these pumps always provide a certain amount of water flow at constant pressure and in any position, they are ideal pumps. These pumps have the API 610 standard, which is one of the strictest standards for centrifugal pumps.

**Annual Production Capacity:**

200 pumps

**Founded:**

2010

### Application:

Fire fighting services and firestations

*This product is final B2B equipment.*

### Technical Specifications:

|                                       |           |
|---------------------------------------|-----------|
| Fluid Working Temperature (°C)        | 40        |
| Working Pressure (bar)                | Max = 300 |
| Discharge (Debit) (m <sup>3</sup> /h) | 4000      |
| Pump Power (kW)                       | 640       |

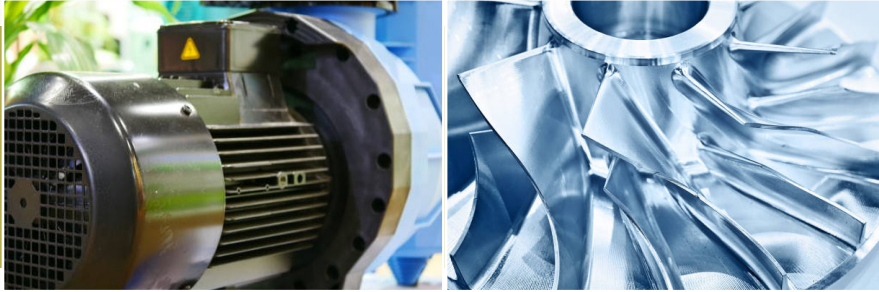
### Advantages:

Lower price than similar products

**International Standards or Permission:**

API 610





**Application:**

Oil and gas industry for long-term operation of pumps and equipment

➤ **API Centrifugal Pumps**

🏠 **Hirad Petro Energy Co.**

**Product Introduction:**

Centrifugal Pumps are mechanical devices to transfer liquids. They transfer the liquid to a higher location (increasing head) or even downstream (usually pools or tanks) by enhancing the liquid pressure. The fluid enters the pump parallel to the pump axis and leaves the pump perpendicular to the axis. Centrifugal pumps are usually used to significantly increase the pressure of a low flow rate fluid. Centrifugal pumps are based on the centrifugal force. The moving components of the pump throw the water drops from center to the outlet under a rotational motion. Since the water drop speed is very high, their velocity converts to pressure as they hit the housing. Different standards have been established for the long-term operation of pumps and equipment in the oil and gas industry. These standards are designed for long-term performance and the easiest way and shortest time for maintenance. The main components of a centrifugal pump include shaft, impeller, housing, bearing casing, mechanical seal (the location of pump sealing and pumped fluid separator and the mechanical part of the pump) and blades.

**Founded:**  
2006

*This product is final B2B equipment.*

**Technical Specifications:**

| Product  | Flow rate (m <sup>3</sup> ) | Pressure (water column,m) | Power (kW) | RPM            | Inlet Flange Size (mm) | Outlet Flange Size (mm) | Impeller diameter (mm) |
|--|-----------------------------|---------------------------|------------|----------------|------------------------|-------------------------|------------------------|
| API cen-trifugal pumps (one or multi stage) centrifugal pumps (one or multi stage) | 2-750                       | 10-500                    | 4-600      | 1,500 to 4,800 | 40-406                 | 25-205                  | 125-750                |

**International Standards or Permission:**  
API 610



➤ **Steam Turbine Rotor**

**Speed:** 3,000 to 14,000 rpm and **Power:** 1 to 3 MegaWatts

🏠 **Turbine Machine m.e.Co.**

[www.turbinmachine.com](http://www.turbinmachine.com)



**Product Introduction:**

For this product, moving turbine blades are installed on turbine disks. When the blades are installed on disks and fixed by a pin or spike, the disks are connected to comprise the turbine rotor. How the moving blades sit on the disks is one of the most important issues in design and production quality. Manufacturers usually use different patterns to connect the blades to disks because the disks usually rotate at high rpms and they should sustain the heavy load induced by the inlet air flow as well as the centrifugal force. The disks are also exposed to imbalance-induced fluctuations. The smallest cracks or porosity at the blade roots lead to crack propagation and blade separation, destroying the downstream turbine path. Three kinds of joints are used to attach the disks to the shaft: (1) fusion welding (EBW), (2) tie bolt, and (3) tie rods.

**Main Export Destinations:**

syria

**Export History:**

Up to 500,000 \$

**Founded:**

2002

**Application:**

Manufacturing moving turbine blades

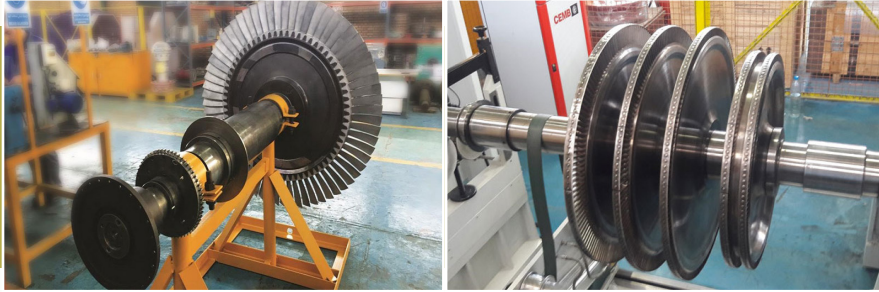
*This product is final B2B equipment.*

**Technical Specifications:**

|                       |  |
|-----------------------|--|
| <b>Speed</b>          | 3,000-14,000 rpm                                   |
| <b>Weight</b>         | >3.5 tons  |
| <b>Blade and Disk</b> | 3,100 blades in 15 rows of disks and a 3.3-m shaft |
| <b>Power</b>          | 1-12 MW  |

**International Standards or Permission:**

- ※ Turbine standards
- ※ API
- ※ Customer satisfaction, including Ministry of Power and oil and petrochemistry supply



## ➤ Single Shaft Multistage Centrifugal Gas Compressor Rotor

🏠 Turbine Compressor Asia Co.

[www.tuca-co.com](http://www.tuca-co.com)



### Product Introduction:

The working principle of centrifugal compressors is to use centrifugal force to increase the kinetic energy of the gas. The compressor shaft is a part of the compressor on which the propellers are installed and energy is transferred through it to the propeller and finally to the gas to be compressed. The length of the shaft in the centrifugal compressor is limited. If its length increases, the critical period approaches the operating area, leading to an increase in the vibration of the assembly. In this type of compressor, the leading energy transfer part of the compressor is the impeller, which is installed on the shaft and rotates with it, forming a single unit. The impeller is the essential main part of the centrifugal compressors, which convert the mechanical energy applied to the impeller into the kinetic energy of the fluid. The way it works is based on the centrifugal force that is applied to the fluid due to the movement of the rotational axis. In this way, it increases the fluid's kinetic energy, separates it from the edge of the impeller, and enters the casing to reduce the speed and restore the pressure. The construction of these propellers is such that a number of blades are installed between two Shroud plates placed at a certain distance. The set of the impeller, shaft, accessories on the shaft, and in other words, the moving parts of the compressor set are called the rotor. Also, one of the important parts of the rotor assembly is the piston balance. This disk-like piece is installed on the shaft and neutralizes axial force by the gas pressure around it.

**Founded:**  
2011

### Application:

Compressing air and other gases in different volumes and pressures

*This product is final B2B equipment.*

### Technical Specifications:

|                     |                                    |
|---------------------|------------------------------------|
| Working period      | 6500 RPM                           |
| Working temperature | 40°C                               |
| Inlet pressure      | 19 Bar                             |
| Outlet pressure     | 80 Bar                             |
| Useful Softwares    | mill power - geomagic - solidworks |

### International Standards or Permission:

- \* API 687
- \* API 612
- \* API 617
- \* ASME SEC IX
- \* ASME SEC V
- \* ASTM E8-E10-E92-E18-E110-A370-A751-E415-E165-E709-E45
- \* MILITARY STD



## ➤ Single Stage Impulsive Steam Turbine Packages

🏠 Wira Turbo Machinery Co.

[www.wiratehran.com](http://www.wiratehran.com)



### Product Introduction:

Single stage steam turbines are one of the most widely used propellers to run different equipment requiring a driving force, such as pumps, compressors, fans, etc.

Steam turbines are commercialized in five categories. The maximum power currently manufactured and installed is 1.1 MW.

The main parts of a single stage impulsive turbine are

- \* Disc
- \* Blade
- \* Nozzle Ring
- \* Casing
- \* Governing Valve
- \* Hand Valve
- \* Shaft
- \* Bearing
- \* Actuator

**Founded:**

2000

### Application:

In different industries, especially oil, gas, petrochemical and power plant

*This product is final B2B equipment.*

### Technical Specifications:

|                         |              |
|-------------------------|--------------|
| Max initial pressure    | 45~48 Bar    |
| Max initial temperature | 400 °C       |
| Max exhaust pressure    | 6.9~10.3 Bar |
| Max speed               | 4500 RPM     |
| Wheel pitch diameter    | 305 ~ 710 MM |

### Advantages:

Designing steam turbines according to process requirements and the minimum inlet turbine datasheet

**International Standards or Permission:**

- \* API 611



## ➤ Fixed Blades of Gas Turbines Hot Sections

♣ Badr Engineering System Co.

[www.badrssystem.com](http://www.badrssystem.com)



### Product Introduction:

Fixed turbine blades, which have a complicated design and manufacturing process, are the main components to form the hot air flow and guide it toward the moving blade row. Due to being located at the hot section of gas turbines, fixed blades are categorized as hot parts. Due to the special working conditions owing to the high temperature and wear, as well as the mechanical stresses exerted on the blades, the material, shape, manufacturing method, and coating of the fixed blades require a particular and complicated technology. These blades are usually made of high-temperature nickel-based superalloys, and they are coated with alloy MCR and ceramic coatings. The shape and dimensions of the blades are very precise and their curvature is determined by sophisticated fluid and heat transfer calculations.

**Founded:**

1992

### Application:

Forming and guiding hot air flow towards the moving blade row

*This product is final B2B equipment.*

### Technical Specifications:

### Advantages:

Since the hot section of the gas turbine, especially GG and PT rotor blades, are one of the most important and complicated components of the turbine, the repair and maintenance of these components are categorized as high-tech services and productions. It should be noted that the TIT of the turbine is above 1,250 °C, which makes it a class F turbine. The state-of-the-art technologies have been adopted to manufacture the blades, which is made of Inconel 939.

**International Standards or Permission:**

The parts are manufactured according to OEM of the original manufacturer.



## ➤ Moving Blades of Gas Turbines Hot Sections

♣ Badr Engineering System Co.

[www.badrssystem.com](http://www.badrssystem.com)



### Product Introduction:

The main task of moving blades of the hot sections of gas turbines is to transfer the power from combustion to the main shaft of the turbine and turn the piece of equipment which is connected to the turbine, in order to generate electricity or turn the pump. Moving turbine blades, in addition to the properties mentioned about fixed blades, must be free of any porosity to increase their resistance to creep and fatigue loads since they rotate at a very high speed. For this purpose, vacuum casting is done with directional freezing to achieve a columnar crystal arrangement.

**Founded:**

1992

### Application:

Exerting power torque to the main shaft of the turbine and turning the equipment connected to the turbine to generate electricity or turn the pump

*This product is final B2B equipment.*

### Technical Specifications:

### Advantages:

Since the hot section of the turbine, especially the GG and PT rotor blades, is one of the most important and complex parts of the turbine, the repairs of the mentioned parts of the said turbine, which have the following specifications, are among HIGH TECH services and products. It should be noted that this turbine has a TIT above 1250 degrees Celsius, which belongs to the class F turbines that uses the latest technology in the construction of these blades. It should be noted that this component is made of CM 247.

**International Standards or Permission:**

These parts are produced according to (OEM) standards of the main manufacturer



## ➤ Suction Discharge Valves

**Pressure:** more than 60 bar and **Diameter:** more than 15 cm

🏠 **Nika Compressor Co.**

[www.nikacompressor.com](http://www.nikacompressor.com)



### Product Introduction:

Suction-Discharge valves are one of the main components of reciprocating compressors; the optimum performance of the compressor is a function of their conditions. Significant challenges and issues in these valves include leakage control within the permissible range, dealing with suspended particles and liquid droplets, reducing vibration and noise, preventing possible failure and cracking, and ultimately performance improvements in various parts. At Nika Compressor, these valves are designed and manufactured in different sizes for use in various working conditions of the oil, gas, and petrochemical industry, with high precision and quality. The product design process begins with CFD simulation under the operating conditions until the initial design is reached. After stress analysis and achieving proper geometry, continues with material selection and production process design. The manufactured valves are tested according to API618 standard, and the test results are provided to the customer.

**Annual Production Capacity:**

5000 valves

**Founded:**

2010

## Application:

Reciprocating compressors used in oil, gas & petrochemical industries

*This product is final B2B equipment.*

### Technical Specifications:

- \* **Pressure:** over 60 bar
- \* **Diameter:** over 15 cm

### Advantages:

- \* Competitive price
- \* Possibility of custom design

**International Standards or Permission:**

According to API618



## ➤ Dry Gas Seal

📍 Nahadin Arman Co.

[www.nahadin.com](http://www.nahadin.com)



### Product Introduction:

Commonly, in the past, parts such as carbon rings, labyrinth seals, or double face seals with the help of barrier fluid were used to seal gas compressors. The disadvantages of using these methods were that the repairs and installation of these parts were very complicated and expensive. In addition, they occupied a relatively large space in the compressor. Also, to install these items, it was necessary to increase the shaft's size and the shaft's speed and add an oil lubrication system, which caused excessive energy wastage. Dry Gas Seal solved all these problems by moving two parallel plates facing each other and creating a thin film of gas, and in this way, performed the leakage sealing operation in a dry manner.

The dry gas seal consists of two rotating and fixed sets, which include parts such as a face ring, seat ring, retainer, coil springs, secondary seal, sleeve, etc.

#### Export History:

Up to 500,000 \$

#### Main Export Destinations:

Russia, Venezuela, Iraq

#### Annual Production Capacity:

The nameplate capacity of one shift of the company is 2100 complete sets of equipment and 11 tons of industrial parts, and the actual production capacity of the company is 46015 mechanical seal and dry gas seal parts

#### Founded:

1998

### Application:

- \* Prevent gas leakage out of the system
- \* Preventing the leakage of expensive, corrosive and dangerous substances, polluting, carcinogenic, explosive gases, etc

*This product is final B2B equipment.*

### Technical Specifications:

|                              |                |
|------------------------------|----------------|
| Shaft diameter (mm)          | 12 – 350 MM    |
| Working Pressure (bar)       | 0 – 520 Bar    |
| Temperature (°C)             | -104 to 490 °C |
| Revolutions Per Minute (rpm) | 28000 RPM      |

### Advantages:

- \* Material upgrade and technology upgrade
- \* Increasing the efficiency and longevity of the equipment

### International Standards or Permission:

- \* API 682
- \* DIN 24960
- \* API 610
- \* API 617
- \* API 614
- \* ISO 1940
- \* API 598
- \* API 599
- \* API 600
- \* API 602
- \* API 603
- \* API 608
- \* API 609



Third Chapter

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# Refining & Petrochemicals



# THIRD CHAPTER

First Chapter

Second Chapter

**THIRD** CHAPTER

## Refining & Petrochemicals

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Catalysts and Chemicals ○

Tanks, Towers and Reactors ○

Control Systems and Instrumentation Equipment ○

Boilers, Heat Exchangers and Burners ○

Valves and Actuators ○

Metering ○



## ➤ Catalysts used in Oil, Gas, and Petrochemical Industries

Reforming, Guard De-sulfurization, Methanation and Hydrogenation Catalysts

### ◆ Savr Oil and Gas Industries Development Co.

[www.sarvco.ir](http://www.sarvco.ir)



#### Product Introduction:

Generally, 20% of industrial products and 90% of chemical products require catalysts in the production process. Therefore, numerous companies worldwide (especially in developed countries) have been producing and supplying catalysts for many years due to the necessity and importance of the catalysts in different industries. Catalysts, mostly based on metallic salts, can reduce reaction time, improve efficiency, adjust reaction conditions, and enhance unit performance.

Savr Oil and Gas Company has achieved significant success in research and production of various catalysts for the oil, gas, petrochemical and steel industries, as well as in the design, implementation and development of GTL (synthetic oil production) units.

Moreover, this company has so far been able to produce all the catalysts used in the production process of methanol, ammonia, urea and in ethylene gas production in the petrochemical industry, and the catalysts used in the production of hydrogen gas in the refineries, catalysts of downstream sectors to convert methanol to formaldehyde and also catalysts used in the steel industry for PERED and MIDERX technologies.

**Founded:**

2004

#### Application:

|  |  |
|--|--|
| <b>Natural gas reforming catalysts (active, semi-active, and neutral)</b>        | Producing H <sub>2</sub> and CO reducing gases to convert iron ore into sponge iron      |
| <b>Hydrogen desulfurization catalyst (HDS) for natural gas flow</b>              | Converting mercaptan compounds in the natural gas into hydrogen disulfide using hydrogen |
| <b>High and low-temperature gas-water shift catalyst (HTSC and LTSC)</b>         | Producing highly pure hydrogen for petrochemical applications                            |
| <b>Methanation catalyst</b>  | Removing CO <sub>2</sub> from the synthesis gas in ammonia production units              |
| <b>Acetylene hydrogenation catalyst</b>  | Removing acetylene from the feed of polyethylene units                                   |
| <b>Methanol synthesis catalyst</b>   | Producing methanol in petrochemical plants   |
| <b>Formaldehyde synthesis catalyst</b>   | Producing formaldehyde in petrochemical plants   |
| <b>Hydrogen removal catalyst</b>   | Removing hydrogen in urea and ammonia production units                                   |
| <b>Endothermic catalyst</b>  | For endothermic gas generators used in part manufacturing and metallurgic industries     |
| <b>Primary and secondary steam reforming catalyst and pre-reforming catalyst</b> | Producing synthesis gas for methanol and ammonia production units                        |
| <b>Ammonia separation catalyst</b>   | To produce synthesis gas in methanol and ammonia production units                        |
| <b>Zinc oxide-based desulfurization catalyst</b>                                 | Removing H <sub>2</sub> S from natural gas   |

*These products are final B2B consumer products.*

#### Advantages:

- \* A wide range of products
- \* Capable of producing new products
- \* Adequate engineering/technical services



## ➤ Isomerization Process Catalyst of Naphtha Oil Fraction

### ◆ Exir Novin Farayand Asia (ENFA) Co.

[www.exirnovinco.com](http://www.exirnovinco.com)



#### Product Introduction:

Catalysts of the isomerization process in oil refining complexes in order to convert paraffin compounds (straight chain) into branched compounds (iso) in order to increase the octane number of hydrocarbonic naphtha oil fraction (paraffin 5 and 6 carbon compounds) and to produce isomerate. Catalysts for naphtha oil fraction isomerization and xylene isomerization processes are divided into the following two categories in a general classification:

1. Pt-Cl/Al<sub>2</sub>O<sub>3</sub> catalysts (platinum/chlorinated aluminum oxide)
2. Pt/H-mordenite catalysts (platinum/mordenite zeolite ionized with hydrogen)

**Founded:**

2012

#### Application:

- \* Normal transformation of paraffins into branched compounds
- \* Conversion of metaxylene to orto-xylene or paraxylene (P-xylene)

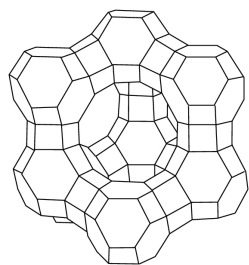
*These products are final B2B consumer products.*

#### Advantages:

- \* Better quality and lower price than similar products
- \* The possibility of recovering and reviving the used catalyst

**International Standards or Permission:**

Isfahan Oil Refinery and National Iranian Petrochemical Company



## ➤ FCC and RFCC Units Catalysts

### ◆ Behdash Chemical Co.

[www.behdashco.com](http://www.behdashco.com)



Behdash Chemical Co.

### Product Introduction:

Fluid Catalytic Cracking (FCC) is the most basic cracking unit in large refineries for gasoline production. This process has undergone many changes. An important milestone in the history of this process was residue fluid catalytic cracking (RFCC). Today, about 20% of the feed of FCC units is atmospheric and vacuum distillation tower residues. Catalysts used in the FCC process are used to break or crack heavy hydrocarbon fractions into light products in the gasoline and diesel range. The important point is that FCC/RFCC catalysts account for the largest consumption of catalysts used in the related oil and gas industry, which is more than 13,000 tons per year. Commercial cracking catalysts include acid-treated natural aluminosilicates along with synthetic aluminosilicate catalysts called zeolites (NaY, USY, REY zeolites) as well as HZSM-5 zeolite, which are formulated with other components such as a natural matrix or binder (bentonite or kaolinite), strengthening agent (alumina), filler etc.

### Application:

- \* Converting heavy and low-value oil fractions into valuable and light products
- \* Molecular breakdown reactions at low pressure
- \* Obtaining higher quality products

**Founded:**

1982

**This product is a final B2B consumer product.**

### Advantages:

| Item                              | Value      | Test Method    |
|-----------------------------------|------------|----------------|
| MAT conversion, %wt               | 75±3       | ASTM D3907     |
| Total SA, m <sup>2</sup> /g       | 260±30     | ASTM D3663-99  |
| Zeolite SA, m <sup>2</sup> /g     | 200±15     | -              |
| Zeolite Unit Cell Size, Angstrom  | 24.50      | -              |
| Pore Volume, cc/g                 | 0.35 ±0.02 | -              |
| ABD, g/cc                         | 0.70-0.80  | ASTMD D4512-99 |
| PSD, %wt                          | -          | ASTM D4464     |
| 0-20 microns                      | <2         | -              |
| 0-40 microns                      | 12-15      | -              |
| APS, μm                           | 70-80      | ASTM D4464     |
| Alumina Oxide, %wt (dry basis)    | 47-50      | XRF            |
| Sodium, %wt (dry basis)           | <0.3       | ASTM D1977-98  |
| Rare Earth Oxide, %wt (dry basis) | 3.0-5.0    | XRF            |
| SO <sub>4</sub> , %wt (dry basis) | 0.7±0.2    | -              |
| LOI, %wt                          | <15        | -              |
| Attrition Index                   | 5±2        | ASTM D5757     |

### Advantages:

- \* The activity level or conversion percentage of Grace catalyst is around 77 to 80 percent
- \* High production rate of gasoline and LPG with low tendency to produce low methane and ethane gases
- \* Good wear resistance

### International Standards or Permission:

- \* ISO9001 TÜV NORD (Germany)
- \* ISO14001 TÜV NORD (Germany)
- \* ISO18001 TÜV NORD (Germany)
- \* NACI ISO17025



## ➤ Natural Gas Reforming Catalysts with Steam

All three types of Primary, Secondary and Autothermal

### ◆ Khwarizmi Technology Development Co.

[www.khwarizmico.com](http://www.khwarizmico.com)



#### Product Introduction:

Natural gas reforming catalysts with water vapor (all three types, primary, secondary, and autothermal) are used in industrial reformers for natural gas processing with water vapor to produce synthesis gas required by petrochemical complexes that produce methanol, ammonia, and urea. The production method of these catalysts is very similar to the reforming catalyst production method used in direct iron ore reduction (DRI) units.

These catalysts contain active nickel metal based on alumina. The production of these catalysts includes two production stages (1) catalyst base, (2) catalyst calcination, which is very important in the production process.

**Founded:**

2013

#### Application:

- \* One of the most common ways to produce hydrogen fuel is the methane reforming process with steam; Therefore, this catalyst is used to produce the hydrogen needed in the world.
- \* Use in industrial reformers to process natural gas in the presence of water vapor to produce synthesis gas required by petrochemical complexes that produce methanol, ammonia and urea is another use of this catalyst.

*This product is a final B2B consumer product.*

#### Technical Specifications:

- \* High resistance to steam and steam condensation
- \* Low percentage of sulfur and chlorine
- \* Ease of activation of the catalyst
- \* High catalytic activity and low pressure drop due to optimized geometry and high external surface area
- \* Low percentage of output methane due to high specific surface
- \* Low temperature of the tube wall due to proper heat transfer

#### Advantages:

- \* Higher strength than foreign products
- \* Excellent performance

#### International Standards or Permission:

- \* ISO 10002: 2018
- \* ISO 10004: 2018
- \* ISO 31000: 2018
- \* ISO 29001: 2020
- \* ISO 45001: 2018
- \* ISO/ IEC 17025:2017
- \* HSE-MS



## ➤ Sulfur Recycling Catalysts

Claus Catalyst

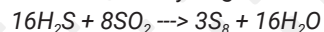
◆ Pars Pigment & Catalyst Co.

[www.ppandc.com](http://www.ppandc.com)



### Product Introduction:

Sulfur recovery catalyst or SRU is used in the famous Clause process in gas and crude oil refining companies to convert hydrogen sulfide (H<sub>2</sub>S) to sulfur (S).



There are different types of sulfur recovery catalysts, which can be divided into the following three categories:

1. Aluminum-based catalysts
2. Oxygen scavenger catalysts (treated with iron)
3. Titanium oxide catalysts: It has multiple uses and is used to hydrolyze CS<sub>2</sub> and COS compounds in feed.

The complete production process of this catalyst includes the following steps:

1. Crystal formation (nucleation) from alumina powder or titanium oxide
2. Shaping operations
3. Heat treatment (drying and calcination)

**Founded:**

1976

### Application:

Gas and crude oil refining companies use it to convert hydrogen sulfide (H<sub>2</sub>S) to sulfur (S).

*This product is a final B2B consumer product.*

### Technical Specifications:

|                         |                                |         |
|-------------------------|--------------------------------|---------|
| <b>Chemical % (m/m)</b> | Al <sub>2</sub> O <sub>3</sub> | >93     |
|                         | Fe <sub>2</sub> O <sub>3</sub> | <0.03   |
|                         | SiO <sub>2</sub>               | <0.1    |
|                         | Na <sub>2</sub> O              | <0.25   |
| <b>Physio-Chemical</b>  | Exterior                       | 4~6 mm  |
|                         | Specific Surface area          | >300    |
|                         | Pure Volume                    | >0.4    |
|                         | Crushing Strength              | >150    |
|                         | Bulk Density                   | 0.6~0.7 |
|                         | Abrasion Rato                  | <0.1    |

### Advantages:

Localized technology

### International Standards or Permission:

Product approvals from the Research Institute of Petroleum Industry



## ➤ Sulfur Adsorber from Oil and Gas Streams Based on Zinc Oxide-Copper Oxide | Sulfur Guard

- ◆ Researching and Manufacturing Gahar Ceram Co. [www.gaharceram.com](http://www.gaharceram.com)



### Product Introduction:

These adsorbents are designed and produced to adsorb and remove sulfur-containing pollutants in various feeds. Most of these adsorbents are based on zinc oxide-copper oxide, which is synthesized by the coprecipitation method. In the adsorbent production process, some amount of binder or shaper (such as alumina (up to 15%)) is used to shape the product. These adsorbents are installed in the oil and natural gas flow paths, headed to various processes such as isomerization, reforming, etc. They aim to minimize sulfur-containing impurities, including H<sub>2</sub>S, mercaptans, disulfides, thiophenes, etc. The importance of removing sulfur-containing pollutants from various oil and gas flow is the poisoning of downstream catalysts, equipment corrosion, and environmental and safety risks. According to the type and amount of sulfur compound and feed, the adsorption capacity of these catalysts can be changed through the specific surface area of zinc oxide-copper oxide and the type and amount of primary binder.

#### Export History:

Up to 500,000 \$

#### Main Export Destinations:

CIS, Venezuela, Iraq, Russia

#### Annual Production Capacity:

250 Tons

#### Founded:

1994

### Application:

Oil and Gas industries

*This product is a final B2B consumer product.*

### Technical Specifications:

Usually, these catalysts are designed as filaments with a diameter of 3 to 5 mm and produced by the extrusion method. But they can also be made in the form of tablets.

### Advantages:

- \* The best company in Iran in the field of producing specialized adsorbents for oil, gas, and petrochemical industries
- \* Achieving a powder product with a surface area of 100 m<sup>2</sup>/g and better than the American sample
- \* High activity
- \* Maximum sulfur component adsorption capacity

### International Standards or Permission:

Product approval from the Oil Industry Research Institute in Iran





## ➤ Molecular Sieves | Zeolites 3A, 4A, 5A and X13

◆ Nitel Pars Technology Excellence Co.

[www.nitelpars.com](http://www.nitelpars.com)



### Product Introduction:

Zeolites are a kind of molecular sieve. They are one of the most important surface (physical) absorbers for water and sulfur compounds in the oil and gas industry, such as mercaptans and H<sub>2</sub>S (necessary for crude oil and gas refinement), aqueous impurities and pollutants (necessary for wastewater treatment), and air pollutants, such as CO and CO<sub>2</sub>, due to high polarity of the internal surface of their cavities. These compounds are a kind of aluminosilicate with broad diversity. Based on their molecular structure and crystal lattice, zeolites can be categorized into two main groups: natural and synthetic. Some of the most important synthetic zeolites include A, X, Y, and ZSM-5. Zeolite A is divided into A3, A4, and A5 due to their different cavity size (i.e., 3Å, 4Å, and 5Å). Cavity size is the major factor for absorption speed, absorption rate, and the material that can be absorbed. These three zeolites can be converted to each other in a metallic salt-saturated media through the ionic exchange. Other molecular sieves used in the industry include active carbon, clay, porous glass, silica gel, and active alumina.

**Founded:**

2014

### Application:

Preparing molecular sieves for oil, gas, and other industries

*These products are final B2B consumer products.*

### Technical Specifications:

|                    |   |
|--------------------|---|
| <b>Zeolite A3</b>  | Potassium sodium aluminosilicate with 3Å-diameter cavities, used for deep drying (dehydrating) fuel gases produced by the cracking process, unsaturated hydrocarbons (ethylene, propylene, butadiene, and acetylene), aromatic compounds (BTX), lightweight alcoholic solvents (ethanol and methanol), and food grade CO <sub>2</sub> |
| <b>Zeolite A4</b>  | Sodium aluminosilicate with 4Å-diameter cavities, used for drying gases, alkane solvents, gases such as argon, the drying agent for medicine packages and electronic parts  |
| <b>Zeolite A5</b>  | Calcium sodium aluminosilicate with 5Å-diameter cavities, used for drying natural gas and absorbing CO <sub>2</sub> , CO, H <sub>2</sub> S, nitrogen, hydrogen, and inert gases   |
| <b>Zeolite X13</b> | Type X sodium aluminosilicate with 9Å-diameter cavities, used for absorbing water, mercaptans, and CO <sub>2</sub> , normal drying of air in industries, separating oxygen from nitrogen in hospital oxygen concentrators, low recovery temperature, long service life  |

### International Standards or Permission:

Product approval (A3 and X13) by Iranian petroleum industry Co. research center



## ➤ Demulsifiers Used in Drilling

### ◆ Energy Chemical Co. Semnan

[www.energychemstore.com](http://www.energychemstore.com)



#### Product Introduction:

Demulsifiers or emulsion breakers are special chemicals that play an essential and strategic role in separating oil-related materials. These materials overcome the water-oil emulsion and lead to water separation from oil. Due to high amounts of water, salt, and other solids in crude oil, separating these substances from crude oil in the initial extraction is necessary before refining the crude oil. Because the presence of these substances, especially in water, which also contains some dissolved salt, leads to a decline in the quality of oil in the world market and will even lead to not buying it if the allowed amount is not met. It is necessary to investigate various factors affecting the performance of demulsifiers, such as the rheology of interfacial properties, degree of hydrophilicity and hydrophobicity, speed of mass transfer from the demulsifier to the interface, etc.

The product is a formulation of one or more ethoxylated and/or propoxylated polymers, along with some additives. These additives are alkyl aryl sulfonic acids, fatty acid esters, bisphenol glycol ethers and esters, sodium dodecyl sulfate, etc. In addition, it contains substances soluble in solvents, such as xylene, heavy aromatic naphtha, isopropanol, methanol, 2-ethyl hexanol, etc. All these extra parts can be added physically and in specific percentages.

**Founded:**

1976

#### Application:

Separating water from oil

*This product is a final B2B consumer product.*

#### Technical Specifications:

According to sources and references, demulsifiers are a combination of different materials, including acid or base catalyzed phenol formaldehyde resins, polyols, polyamines, polyethylene imines and even epoxy resins, whose main component is based on polymer or copolymers, which must be prepared before use. be ethoxylated or propoxylated in a controlled manner.

#### Advantages:

- \* Localized
- \* High technical level

#### International Standards or Permission:

- \* ISO 9001:2015
- \* E&P certification



**Application:**

- \* Industries such as steel, petrochemical, oil, shed construction, food, etc.
- \* Hospitals, including all treatment centers and transportation from production centers to the place of consumption

➤ **Cryogenic Tanks and Liquid Nitrogen Flasks**

◆ **Vida Sanet Sazane Akam Co.**

[www.cryomed.ir](http://www.cryomed.ir)



**Product Introduction:**

Cryogenic tanks and liquid nitrogen flasks are known as cooling tanks. These tanks consist of two storage tanks, and the area between the two tanks is thermally insulated.

Cryogenic tanks are static or portable. Static cryogenic tanks are designed for use in a fixed place, and portable tanks include small mobile and portable tanks mounted on wheels for use in workshops and laboratories. These tanks are generally classified as pressure tanks. Those applications requiring direct access to the liquid include a wide range of pressurized open tube conduits (flasks). Cryogenic tanks are offered in different sizes, pressures, and flow rates to meet user needs.

**Founded:**

2017

*This product is final B2B equipment.*

**Technical Specifications:**

|                                       |   |
|---------------------------------------|---|
| <b>Device Material Type</b>           | A516 GR 70 alloy sheet, carbon stainless-carbon steel   |
| <b>Tanks Dimensions</b>               | According to the customer's needs, up to 22 cubic meters (the company's production capacity is up to 200 cubic meters, according to the management) |
| <b>Shape</b>                          | Cylindrical   |
| <b>Maximum Loading</b>                | 20 flow rates   |
| <b>Temperature tolerance of tanks</b> | -196°C, and the outside temperature is 120°C  |

**Advantages:**

Insulation and isolation of tanks is done in the best way to increase the shelf life

**International Standards or Permission:**

EN 13458-2; Turkey



## ➤ Cryogenic Double-Walled Tank Package with Working Temperature Lower than $-50^{\circ}\text{C}$

◆ Delvar Afzar Industrial Equipments Co.

[www.delvarafzar.com](http://www.delvarafzar.com)



### Product Introduction:

These tanks are double-walled and consist of two coaxial tanks, the inner tank is made of stainless steel, and the outer tank is made of carbon steel, and they are used to store liquid industrial gases at a very low temperature of  $-196^{\circ}\text{C}$ . Perlite powder is used to insulate between the two walls.

**Annual Production Capacity:**

400 Tons, 40 tanks in different sizes

**Founded:**

2010

### Application:

For the storage of liquid industrial gases

*This product is final B2B equipment.*

### Technical Specifications:

|              |                                 |
|--------------|---------------------------------|
| Tanks Volume | 3000 to 80000 Liter             |
| Pressure     | 18 to 36 Bar                    |
| Temperature  | Less than $-50^{\circ}\text{C}$ |

### Advantages:

- \* Design and construction of cryogenic tanks in volumes of 3 to 80 cubic meters at working pressures of 18, 22, and 36 for the servicing of oxygen, nitrogen, argon,  $\text{CO}_2$ , and other cryogenic products at a service temperature of  $-196^{\circ}\text{C}$  under the technical license of Linde Germany.
- \* High-quality level and complies with European standards

### International Standards or Permission:

- \* License granting agreement and transfer of technical know-how from Linde company for the construction of double-walled cryogenic tanks
- \* Cooperation agreement in the manufacture of 12 hydrogen storage bolt devices with the Austrian company Bertsch
- \* ISO13485 – ASME V – ASME VIII – ASME IX



## ➤ Integrated Distillation Tower

◆ Petro Kimia Arvin.Co.

[www.pkarvin.ir](http://www.pkarvin.ir)



### Product Introduction:

Distillation is one of the most important and common separation methods based on the distribution of components between the two phases of liquid and gas. In fact, distillation is one of the most common ways to separate materials from each other due to the difference in their boiling points. Distillation is a physical process for separating substances with different boiling points.

In general, the distillery tower consists of 4 main parts:

Tower, Reboiler, Condenser, peripheral equipment including: control devices, intermediate heat exchangers, pumps and product collection tanks

**Founded:**

2013

### Application:

Process towers are regarded as one of the main pieces of equipment of a petrochemical plant or refinery to process input feed and produce output products.

*This product is final B2B equipment.*

### Technical Specifications:

| Material                         | Metal   |
|----------------------------------|---|
| <b>Chemical composition</b>      | The feed enters from the upper part and based on the design and depending on the internal type, they are considered as output products in several stages        |
| <b>Physical specifications</b>   | The main material is carbon steel and stainless steel in some corrosive parts. The internal material is mostly stainless steel.                                 |
| <b>Physical specifications</b>   | Cylindrical   |
| <b>Mechanical specifications</b> | 20 flow rates   |
| <b>Dimensions</b>                | <ul style="list-style-type: none"> <li>* <b>Height:</b> 70 m</li> <li>* <b>Sheet thickness:</b> 75 mm</li> <li>* <b>Diameter:</b> more than 4 meters</li> </ul> |

### Advantages:

- \* High quality
- \* Reduced manufacturing time of the product compared to similar products



## ➤ Electromagnetic-Based Flowmeters

◆ Control System Co.

www.controlsystemco.com



### Product Introduction:

Flowmeters are devices for measuring the speed, volume, and flow rate of flows inside ducts and pipes. Electromagnetic flowmeters measure these parameters based on Faraday's law of electromagnetic induction. Electromagnetic method is one of the most precise methods to measure the flow parameters because the instant flow rate is the average flow rate of millions of locations in the contour cylinder. The instant flow rate of these locations is constantly being measured by the flowmeter. For instance, the flow rate measured by two-sensor ultrasonic flowmeters is the average flow rate of different locations in the signal pathway between the two sensors and not inside the whole tube. Therefore, the ultimate accuracy of ultrasonic flowmeters is within  $\pm 1$  to  $\pm 3\%$  of the maximum readable full scale value. The accuracy of the electromagnetic flowmeter is within  $\pm 0.2$  to  $\pm 0.5\%$ . The different flowmeters produced by the company include:

### Application:

Electromagnetic flowmeters are used in different industries, including oil and petrochemistry, wastewater treatment, water supply pipelines, food, medicine, etc. These flowmeters are commonly used to measure:






- \* the flow rate of the pipe cross-section
- \* the fluid velocity passing through a pipe
- \* the fluid volume passing through a pipe

**International Standards or Permission:**

EMC tests by EPIL Co.

**Founded:**

2015

|   |   |   |   |   |
|---|---|---|---|---|
| Flange connection to the steel body and NBR lining                                  | Clamp connection to the steel body and PTFE lining                                  | Flange connection to the steel body and PTFE lining                                 | Flange connection to the steel body and PTFE lining                                 | Clamp connection to the steel body and ceramic zirconia lining                      |
|  |  |  |  |  |
| Low temperature and low corrosive liquids   | high temperature and highly corrosive liquids                                       | high temperature and highly corrosive liquids (corrosive media)                     | high temperature and highly corrosive liquids (noncorrosive media)                  | Filler lines or linear or rotary dozing (corrosive media and liquid)                |

*This product is final B2B equipment.*

### Technical Specifications:

|                           |   |                      |                           |
|---------------------------|---|----------------------|---------------------------|
| <b>Supply</b>             | 22-26 VDC                               | Connection Material  | AISI 316L Stainless Steel |
| <b>Communication</b>      | Modbus RTU                              | Lining Material      | Alumina,Zirconia          |
| <b>Output</b>             | Two Digital Output<br>one Analog Output | Electrods Material   | Titanium                  |
| <b>Digital Input</b>      | One Unit(24VDC,5mA)                     | Cable Connection     | M12 Standard Connector    |
| <b>Measuring Accuracy</b> | 0.2 %                                   | Process Connection   | 3A<br>Clamp,Nut,Flange    |
| <b>Enclosure Material</b> | AISI 304 Stainless Steel                | Enclosure protection | IP68                      |

### Advantages:

- \* Automatic hardware error detection and fixing the error, if possible
- \* Electronically removing all the noises using programming
- \* Remotely changing the microcontroller program without the need for programmer use by the customer
- \* Automatically backing up all parameters and automatically restoring the backup files
- \* Design and manufacturing a broad range of electromagnetic flowmeters for different applications with different materials for electrodes, body, and lining



## ► Titanium Air Coolers

◆ Fateh Sanat Kimia Co.

[www.fatehsanat.com](http://www.fatehsanat.com)



### Product Introduction:

Air coolers are equipment in which air, with the help of provided fans as a cooling fluid, collides with tubes containing hot fluid and decrease the hot fluid's temperature. Usually, to increase thermal efficiency, the tubes have fins to increase the heat transfer level.

These exchangers are cross-type in terms of the flow shape, and a fan provides the airflow required to cool the fluid inside the tubes. If the fan is placed above the pipes, it is called suction; if it is placed below the pipes, it is called blowing. The suction type is more efficient due to the uniform distribution of airflow. These exchangers are usually installed on the structure and height from the ground level to allow air transfer. Fin tubes are used in air-cooled exchangers in different ways. One of the essential types of fins is extruded fins, usually made of aluminum. Another type of fin used in air cooling exchangers is embedded fins. These fins are generally made of steel or aluminum. These fins are in the form of thin rods with a circular or square cross-section inserted into the tube wall containing hot fluid.

**Founded:**

2000

### Application:

Reducing the target fluid temperature in refinery and petrochemical industries

*This product is final B2B equipment.*

### Technical Specifications:

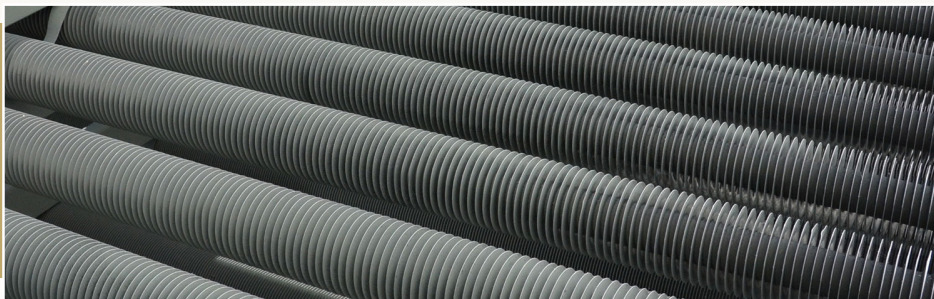
|                        |                |
|------------------------|----------------|
| <b>Pressure</b>        | 100 to 500 Bar |
| <b>Temperature</b>     | 10 to 45°C     |
| <b>Material</b>        | Titanium       |
| <b>Tube Material</b>   | SA 210 Gr.A1   |
| <b>Fin Material</b>    | AL             |
| <b>Header Material</b> | SA 105         |

### Advantages:

- \* No need for a water source
- \* Low cost due to the use of air

### International Standards or Permission:

- \* Asme Secviii Div1
- \* API 661



## ➤ Titanium and Super Alloy Industrial Shell and Tube Heat Exchangers

◆ Fateh Sanat Kimia Co.

[www.fatehsanat.com](http://www.fatehsanat.com)



### Product Introduction:

Heat exchangers are used in industry to transfer heat between two fluids. A shell and tube heat exchanger is a type of heat exchanger that usually consists of a large cylindrical tank (shell) and many tubes inside. The fluid that moves inside the tubes exchanges heat with the fluid inside the shell that is in contact with the tubes and due to a large number of these tubes and the high contact surface it creates, this heat transfer is optimally transferred.

Tubes are essential in these exchangers, whose outer surface is exposed to the fluid inside the shell, and its inner surface is exposed to the fluid passing through the tubes. The length and diameter of the tubes are determined based on the standard and design. Fins can be used to increase the amount of heat transfer and thermal levels so that by adding a fin, the level of heat transfer and, as a result, the amount of heat transfer increases. Tubes can be designed in a straight or curved shape; Therefore, the number of passes (the number of fluid going back and forth in the pipes) is essential in the design.

Tube sheets are another part of this exchanger responsible for inhibiting the tubes. On the other hand, Baffle plates are installed inside the shell to direct the fluid flow and create disturbance to increase the heat transfer efficiency. Another component is the shell exchanger, designed based on the Tema standard to check its thickness, diameter, and internal pressure.

**Founded:**

2000

### Application:

- ※ These exchangers are used when the fluid on the tube side is very corrosive.
- ※ With the help of these exchangers, can do heat transfer from one fluid to another in heating and cooling systems.

*This product is final B2B equipment.*

### Technical Specifications:

|                             |              |
|-----------------------------|--------------|
| Shell Material              | SA 516 GR.70 |
| Tube Material               | SB 338 Gr.2  |
| Channel Material            | SB 265 Gr.2  |
| Shell Side Fluid            | Process feed |
| Tube Side Fluid             | Sea water    |
| Shell Side Pressure         | 10 Bar       |
| Tube Side Pressure          | 7 Bar        |
| Shell Side Temperature      | 92 Bar       |
| Inner Tube Side Temperature | 75 Bar       |





## ➤ Transfer Line Heat Exchangers (TLE)

◆ Fateh Sanat Kimia Co.

[www.fatehsanat.com](http://www.fatehsanat.com)



### Product Introduction:

This equipment decreases the temperature of the 800 to 1100°C internal fluid (according to the type of incoming fluid) in a few seconds and causes a phase change in ethylene and naphtha. This equipment also recovers the waste temperature and helps steam production and utility. This system changes the phase of the hot fluid by rapidly cooling the gas (in a few seconds), and the wasted heat is used as a stimulus for steam production. The temperature and pressure difference between the hot and cold fluid sides and the presence of coke particles and abrasive particles on the hot fluid side are among the limitations of the correct design and construction of this equipment. To compensate for temperature and pressure differences, the type of welding must be changed. Coke Deflector is used to prevent the stoppage of the operation process and damage to other parts due to the entry of coke particles. We need welding machines, special instructions, and manufacturing skills to make this equipment. This equipment is designed in two types, Double Pipe & Shell And Tube. In terms of process, it is designed and produced in three primary, secondary and tertiary process models.

**Founded:**

2000

### Application:

- ✳ Due to the high speed of cooling, in a few seconds, it cools the temperature of the internal fluid from 800 to 1100°C (according to the type of incoming fluid) and causes a phase change in ethylene and naphtha.
- ✳ They recover the wasted temperature and help to produce steam and utility.

*This product is final B2B equipment.*

### Technical Specifications:

|                              |                                 |
|------------------------------|---------------------------------|
| Shell Material               | SA209GR. T1A                    |
| Tube Material                | SA 106 GR.B                     |
| Channel Material             | SA 351 CT15C (G-X10NICRNB 3220) |
| Shell Side Fluid             | Cracked Ethylene Gas            |
| Tube Side Fluid              | Demineralized Water             |
| Shell Side Pressure          | 4.5 Bar                         |
| Tube Side Pressure           | 92 Bar                          |
| Shell Side Temperature       | 900°C                           |
| Lunner Tube Side Temperature | 350°C                           |

### Advantages:

The different way of arranging the inner bundle of the tube



## ➤ Titanium Heat Exchanger

◆ Machine Sazi Arak (MSA) Co.

www.msa.ir



### Product Introduction:

As a metal with a high melting temperature and a perfect strength-to-weight ratio, titanium is used in many special functions in industries. Due to its high corrosion resistance, this metal is used in heat exchangers with high corrosive conditions and temperatures. Regarding design principles, titanium heat exchangers are similar to conventional exchangers, but for manufacturing related products, welding and machining operations of titanium metal are challenging. Titanium metal must be welded in a controlled atmosphere.

Since a large amount of equipment has bundles, tubes, and tube sheets, the presence of necessary tests to ensure the quality of welding and expanding work is essential. Some of these tests include:

- \* Mock-up test
- \* Tube Expanding Test
- \* Helium Leak Test
- \* Local Preheating, Dihydrogenation & PWHT Test

### Application:

Chemical equipment, oil, energy, food, etc.

**Annual Production Capacity:**

500 Tons

**Founded:**

1967

**This product is final B2B equipment.**

### Technical Specifications:

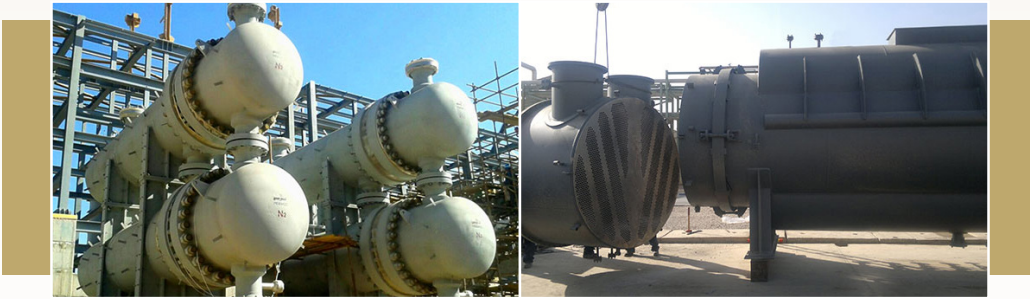
| Row          | Title                 |                                     | Material        |               | QTY. | Total Weight (Kg) |
|--------------|-----------------------|-------------------------------------|-----------------|---------------|------|-------------------|
|              |                       |                                     | Shell Casing    | Tube Impeller |      |                   |
| 1            | 107-E-104/204         | Butan cooler                        | A516-60N        | S8338-2       | 2    | 3,800             |
| 2            | 113-E-102/202         | Lean caustic cooler                 | A516-60         |               |      | 8,800             |
| 3            | 116-E-101/201         | Ethane cooler                       | A516-60N        |               |      | 15,000            |
| 4            | 101-E-104/204/304/404 | Treathed gas cooler                 | A516-70N + 316L |               | 4    | 92,000            |
| 5            | 114-E-101/201         | C3 cooler                           | A516-70N        |               | 2    | 20,000            |
| 6            | 114-E-102/202         | First regeneration gas trim cooler  | A516-60N        |               |      | 3,000             |
| 7            | 114-E-103/203         | Second regeneration gas trim cooler | A312-304L       |               |      | 2,400             |
| 8            | 115-E-101/201         | Regeneration gas trim cooler        | A516-60N        |               |      | 2,900             |
| 9            | 115-E-102/202         | Coled Oondensate cooler             | A106            |               |      | 3,400             |
| <b>Total</b> |                       |                                     |                 |               | 20   | 151,300           |

### Advantages:

- \* Suitable for high-pressure shell and tube heat exchanger applications
- \* Maintenance, service, and replacement of parts
- \* Acceptability in reducing or increasing the capacity by reducing or adding pipes

### International Standards or Permission:

- \* SB-381
- \* GRF2
- \* SB265GR2
- \* A516 Gr 70
- \* PV-ELLITE - HTRI



## ➤ Transfer Line Heat Exchangers (TLE)

🏠 Pidem Co.

[www.pidemco.com](http://www.pidemco.com)



### Product Introduction:

Heat exchangers are used in power, oil, and gas industries to facilitate heat transfer between two fluids. Different heat exchangers with various sizes, components, and designs are used depending on the fluid, pressure, temperature, velocity, required heat transfer rate, process, etc. TLE is a high temperature and pressure heat exchanger that is responsible to rapidly cool down reformer exhaust gases in different units.

**Founded:**

1994

### Application:

Rapid cooling of reformer exhaust gases in all refinery, petrochemical, power, and chemical plants

*This product is final B2B equipment.*

### Technical Specifications:

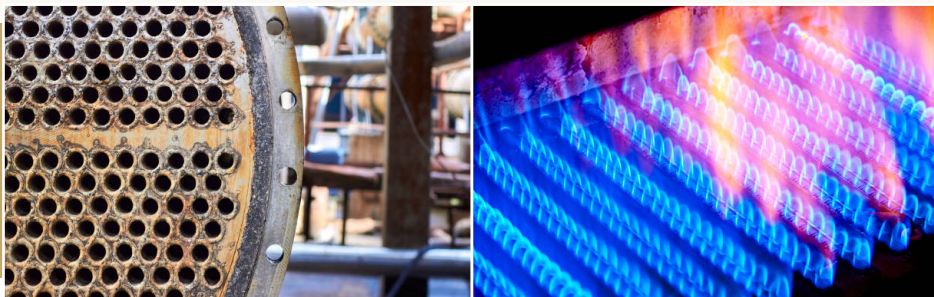
|             |                  |
|-------------|------------------|
| Pressure    | 120 to 140 bar   |
| Temperature | 1,100 to 1,300°C |

### Advantages:

- \* Technical mechanical expertise
- \* Knowledge and technology regarding different manufacturing processes, including cutting, forming, machining, assembly, welding, and heat treatment

### International Standards or Permission:

- \* ISO9001:2008
- \* OHSAS18001:2007
- \* Safety Competence Certificate
- \* Contractor Competence Certificate



## ➤ Shell and Tube Heat Exchangers

Made of Nickel, Molybdenum and Titanium alloys

### ◆ Behran Mobaddel Co.

[www.behranmobaddel.com](http://www.behranmobaddel.com)



### Product Introduction:

Shell and tube heat exchangers are the most common and widely used heat exchangers in different industries. Shell and tube heat exchangers are designed and manufactured in different sizes for various applications. These heat exchangers include a large number of fluid-containing tubes, the outer surface of which are in contact with another fluid. The heat exchange is carried out through the intermediate surface, which is the tube wall. So, the tube material should allow for proper heat conduction, as well as high strength. For shell and tube heat exchangers, two metal sheets (tube sheets) are placed at both ends of the exchanger with numerous holes (equal to the number of pipes inside the exchanger). The tubes are connected to these sheets by welding or mechanical joints. Both headers of the exchanger are designed and manufactured so that the fluid enters the exchanger from one header, flows toward the tube inlets, and is collected at the other header by passing through the tubes. The fluid passing through the shell should have maximum contact with the outer surface of the tubes to provide the best heat transfer performance. To this end, panels are used called "baffle".

**Founded:**

1981

### Application:

Heating and cooling various fluids, including oils, petroleum products, water, steam, etc.

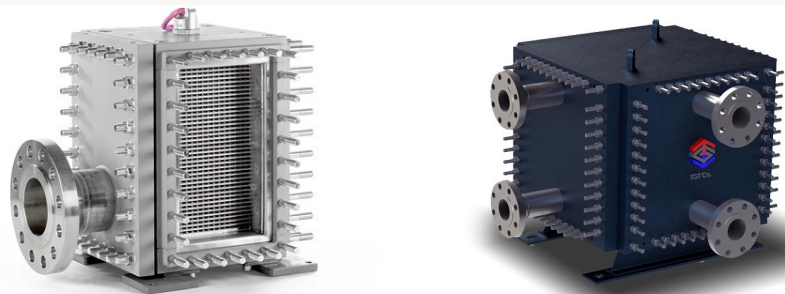
*This product is final B2B equipment.*

### Technical Specifications:

|                      |                        |
|----------------------|------------------------|
| Size                 | 205~1200 mm            |
| Type                 | BEM                    |
| Connected in         | Series - Parallel      |
| Temperature (in/out) | 6/10 – 20/15 °C        |
| Density              | ~998 kg/m <sup>3</sup> |
| Viscosity            | 1~1.5                  |
| Pressure             | 1 ~ 4 Bar              |

### International Standards or Permission:

- \* TEMA
- \* ASME SecVIII D1
- \* API660
- \* ASTM



## ➤ Plate Heat Exchangers with a Titanium or Superalloy Plate

Such as Inconel and Superduplex Plates

### ◆ Taha Ghaleb Toos (TGT) Co.

[www.tgt-phe.com](http://www.tgt-phe.com)



#### Product Introduction:

Plate heat exchangers are a type of heat exchangers in which plates create the exchange surface between two hot and cold fluids. The material of plates is very diverse depending on the type of fluid, which includes steel, stainless steel, titanium, nickel, etc. The operation of these types of converters is based on the principle of passing two fluids with different temperatures next to each other. The plates in the exchanger are responsible for the exchange between two fluids. These converters can be classified into the following types:

- \* Washer
- \* Welded
- \* Semi-welded
- \* Spiral
- \* Shell and screen

#### Main Export Destinations:

CIS, Persian Gulf Neighboring

#### Annual Production Capacity:

2800 Devices

#### Founded:

2000

#### Application:

Food, chemical, petroleum, pharmaceutical, marine and thermal, and refrigeration industries

*This product is final B2B equipment.*

#### Technical Specifications:

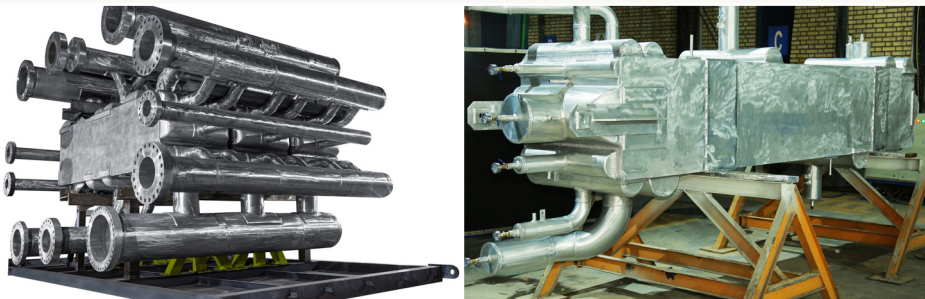
|   |               |
|---|---------------|
| The thickness of the Constituent Plates | 0.5 ~ 1/2 mm  |
| Working Temperature Range               | -200 ~ 500 °C |
| Working Pressure                        | 0 ~ 600       |
| Discharge through Plate Heat Exchanger  | 1 ~ 5000      |

#### Advantages:

- \* Increasing the efficiency of required thermal surface exchanger
- \* Reduce the final price of the exchanger

#### International Standards or Permission:

- \* Hydro test of Taha Ghaleb Toos
- \* Factory standard of heat exchangers from standard department in Iran



## ➤ Designing and Manufacture of Coldbox Cryogenic Heat Exchanger

◆ Hilavis Arina Co.

[www.hilavis.com](http://www.hilavis.com)



### Product Introduction:

Coil wound heat exchanger or bath vaporizer is a special heat exchanger for cryogenic units. Coil wound heat exchangers are a kind of multi-stream heat exchangers that similar to PFHEs, play an important role in heat integration of gas processing units, including LNG, ethylene, and air separation. The specific shape and the wide range of material used for these exchangers have made them a suitable choice for a broad range of processing applications. Coil heat exchangers are made of multiple tube bundles, wrapped around a cylinder on top of each other. Each bundle can represent an individual flow.

#### Export History:

Up to 500,000 \$

#### Main Export Destinations:

Iraq, Azarbijan and ...

#### Founded:

2008

### Application:

- \* Steam Vaporizer
- \* Natural Gas Liquefaction
- \* LNG
- \* NGL
- \* Ethylene Vaporizer
- \* Multi-Stream Condenser
- \* Methanol Synthesis
- \* Hydrogenation
- \* Air Separation Plant
- \* Isothermal Reactor

*This product is final B2B equipment.*

### Technical Specifications:

|                      |   |
|----------------------|---|
| Temperature          | -250 to -60 °C  |
| Pressure             | 150 bar   |
| Shape and Dimensions | Tube diameter: 12-25 mm   |
| Other Specifications | <ul style="list-style-type: none"> <li>* Stainless 321 alloy</li> <li>* 5 times more compact than shell and tube heat exchangers</li> <li>* Butyl rubber washers and spiral gaskets, depending on the operating conditions</li> </ul> |

### Advantages:

- \* Thermal design for multi-stream cryogenic heat exchangers
- \* Hydraulic design for multi-stream cryogenic heat exchangers
- \* Material selection based on service conditions and pressure
- \* Coiling geometry definition
- \* Tube cold working without flattening
- \* Helium leak test

### International Standards or Permission:

Marun petrochemical complex



## ➤ Light and Heavy Oil-Fuel Modular Burners

**Capacity:** 600-12000 kW

### ◆ Packman Industrial Group

[www.packmangroup.com](http://www.packmangroup.com)



### Product Introduction:

A burner is a structure that receives combustion air and fuel, mixes these two, creates suitable conditions for combustion, and provides the primary heat required for utility systems. From the point of view of the type of combustion, the burners are placed in two categories: premix burners and nozzle head mixture burners. Also, burners are divided into three categories, single-stage, two-stage, and continuous or modular.

#### Main Export Destinations:

Iraq, Azarbijan, Armenia, Uzbekistan and ...

#### Export History:

Between 500,000 \$ and 1,000,000 \$

#### Annual Production Capacity:

1000 Devices

#### Founded:

1976

### Application:

Power plants, hot oil boilers, steam boilers, etc.

*This product is final B2B equipment.*

### Technical Specifications:

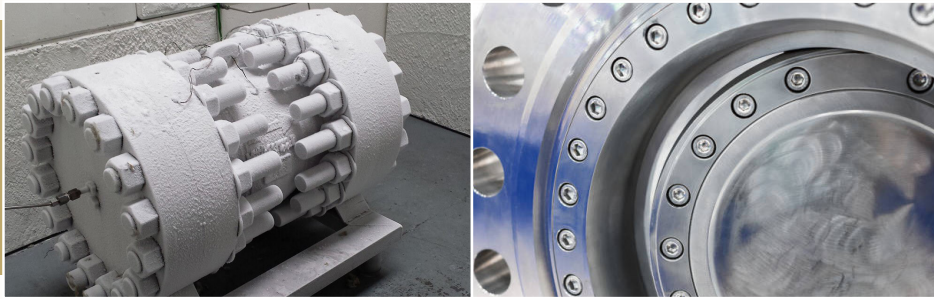
- \* Ability to control with PID system
- \* Fueling system performance based on back pressure control to create modular properties
- \* Design as monoblock structure up to 17 MW capacity
- \* Has class 2 and 3 NO<sub>x</sub> pollution along with carbon monoxide production below 10 ppm according to national standard 7595

### Advantages:

- \* Smaller dimensions and less noise, higher durability of parts, and prevention of thermal stresses
- \* Working on the fuel and air curve to reach a specific temperature
- \* Setting the ignition point independent of the fuel curve
- \* Gas line leak detection and convenient fault finding based on error codes
- \* Burner control capability up to 5 independent sections
- \* Ability to control from outside the engine room
- \* Can install a Flue Gas Recirculation system (FGR) to reduce NO<sub>x</sub> emissions
- \* It can install an inverter (variable engine speed setting)
- \* It can use O<sub>2</sub> and CO sensors to more accurately adjust the amount of air and fuel combustion
- \* It has a secondary preheating system connected to the burner to preheat the heavy liquid fuel and prepare it to the appropriate viscosity for spraying.
- \* Pre-refining and post-refining time adjustment
- \* Ambient temperature compensation
- \* Ability to connect to building BMS systems
- \* High conversion ratio (up to 8 in some capacities) and energy saving
- \* Lower repair and start-up costs
- \* after sales service

### International Standards or Permission:

Iranian national standard 7594



## ► Butterfly Valves with API 6D Standard

**Class 150:** 24 inches and above, **Class 300:** 20 inches and above

◆ Gostaran ShirSazi Tehran Sufa (GSSTS) Co.

[www.gssts.co](http://www.gssts.co)



### Product Introduction:

Butterfly valves are industrial valves. Their handwheel is quarter-turn, meaning the valve can be opened and closed by a 90-degree rotation of the handwheel. A circular disk is used to cut off or regulate the flow. Butterfly valves are usually used for low-pressure gas and liquid transmission lines and slurry flows. A butterfly valve is composed of four main components:

- \* **Body:** butterfly valve body is located between two flanges. The most common body designs for these valves are lug and wafer.
- \* **Disk:** the component by which the flow is cut off
- \* **Stem:** a shaft or a one-piece and/or two-piece axis
- \* **Seat:** a butterfly valve with a flexible seat uses the contact of the disk edge with the seat to close the valve.

### Application:

Flow On/Off

**Founded:**

1992

*This product is final B2B equipment.*

### Technical Specifications:

|                                  |  |
|----------------------------------|--|
| <b>Valve Type</b>                | Butterfly  |
| <b>Rating</b>                    | 150~600  |
| <b>End Connection</b>            | Wafer, Lug                                       |
| <b>Size</b>                      | 2" ~ 78"   |
| <b>Material For Construction</b> |  |
| <b>Body</b>                      | A216 WCB   |
| <b>Disc</b>                      | ASTM A351 CF8                                    |
| <b>Shaft</b>                     | SS 304   |
| <b>Seat</b>                      | EPDM   |
| <b>Valve Construction</b>        |  |
| <b>Type</b>                      | Cat (A)  |
| <b>Construction</b>              | Concentric Type                                  |
| <b>Stem</b>                      | Non Rising Stem                                  |
| <b>Design Standard</b>           | API609, ASME B16.34, AWWA C504<br>BS5155         |
| <b>Test Pressure Standard</b>    | API598   |
| <b>Face To Face Dimension</b>    | Manufacture Standard, API609, ISO5752,<br>BS2080 |
| <b>Wrench Operated</b>           | Operator   |
| <b>Process Condition</b>         |  |
| <b>CWP</b>                       | 19.6 bar   |
| <b>Max Temperature</b>           | 425 °C   |

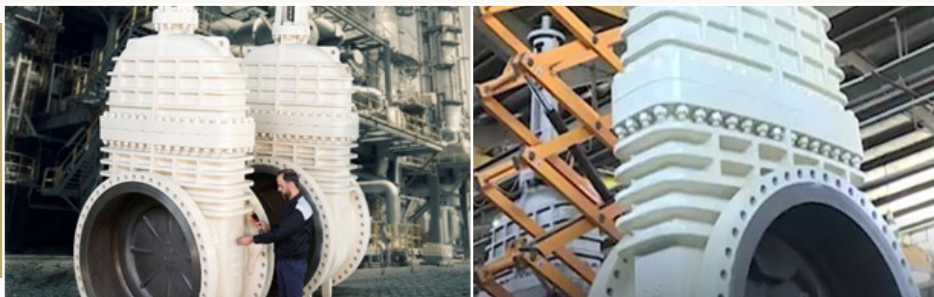
### Advantages:

- \* Low weight and relatively proper size compared to other valves
- \* No need to additional support
- \* Easy and fast installation on the pipeline
- \* Lower pressure drop compared to other valves
- \* Lower repair costs compared to other valves
- \* Horizontal, vertical, etc. installation

### International Standards or Permission:

API598, API609, API609, API609, BS EN 12266-1, BS5155, BS6755, BS2080, BS4504, AWWA C504, ASME B16.34, ASME B16.10, ASME B16.5, ISO5752, ISO 15156, MSS-SP 44, NACE MR0175.



*This product is final B2B equipment.*

## ➤ Gate Valves with API Standard

◆ Gostaran ShirSazi Tehran Sufa (GSSTS) Co.

[www.gssts.co](http://www.gssts.co)



### Product Introduction:

Gate valves are a kind of industrial valves used to open and close the flow path. These valves cannot regulate the flow and thus, they are merely on/off valves. Different modules used in these valves include:

- \* **Body:** optimizing the product and reducing the casting volume and weight of the valve
- \* **Bonnet:** connected to the body through STUD and NUT with the same material as the body
- \* **Trim:** all the surfaces in direct contact with the fluid
- \* **Stem:** an upward moving part which connects the wedge to the seat ring and enables sealing by overcoming the fluid and friction forces
- \* **Back Seat Bushing:** When the valve is fully open, stem is in contact with the sealing seat. So, valve packing can be replaced online without leaking or risks.
- \* **Seat Ring:** made of the body material and welded to the body by overlay welding
- \* **Wedge:** the optimal angle between the wedge and seat ring is determined by calculation and trial-and-run.
- \* **Gasket:** to prevent leaking and offer complete sealing at the body-bonnet interface
- \* **Packing:** sealing the stem at the stuffing box

### Application:

Where the pressure drop in the transmission lines is important

**Founded:**

1992

### Technical Specifications:

|                                  |                           |
|----------------------------------|---------------------------|
| Valve Type                       | Gate Valve                |
| Rating                           | 2" ~ 56"                  |
| End Connection                   | Flanged, RF, ASME B16.5   |
| Size                             | 150, 300, 600, 900 & 1500 |
| <b>Material For Construction</b> |                           |
| Body                             | ASTM A216 WCB             |
| Bonnet                           | ASTM A105                 |
| Trim                             | 13%Cr / Seat Stellite     |
| Stem                             | 13%Cr                     |
| Back seat                        | N/A                       |
| Seat                             | A105 + Stellite           |
| Wedge                            | ASTM A216 WCB+13%Cr       |
| Wedge Seat Surface               | 13%Cr                     |
| Gasket                           | Graphite+SS316            |
| Bolting/Nuts                     | ASTM A193 B7, A194 2H     |
| Packing                          | Graphite                  |
| <b>Valve Construction</b>        |                           |
| Type                             | OS & Y Type               |
| Construction                     | Single Piece Wedge        |
| Stem                             | Rising Stem               |
| Special Requirement              | Pressure Seal Bonnet      |
| Design Standard                  | API 600                   |
| Test Pressure Standard           | API 598                   |
| Face To Face Dimension           | ASME B16.10               |
| Operator                         | Gear Operated             |
| <b>Process Condition</b>         |                           |
| CWP                              | 255 bar                   |
| Max Temperature                  | 538 °C                    |

### International Standards or Permission:

API598, API609, API609, API609, BS EN 12266-1, BS5155, BS6755, BS2080, BS4504, AWWA C504, ASME B16.34, ASME B16.10, ASME B16.5, ISO5752, ISO 15156, MSS-SP 44, NACE MR0175.



### ➤ ON-OFF Valves of Trunnion Mounted Ball Model

◆ Petro TAJHIZ Sepahan Co.

[www.ptsbrand.com](http://www.ptsbrand.com)



#### Product Introduction:

The most common final control element in fluid transmission systems is the control valves that control the flow by adjusting the pressure and flow rate of the fluid. The correct valve selection can increase parameters such as efficiency, safety, and profitability. If the valve is considered entirely open or completely closed, it is called ON-OFF, and if it continuously adjusts the flow, it is called MODULATING. Ball valves are one of the types of Rotary Motion valves in which the valve plug is a hollow sphere. These valves can control the flow, but they are primarily used in ON/OFF processes.

The current products include ball valves in different models: In terms of the appearance of the body: Welded Body, Split Body, Top Entry, and Side Entry. Regarding ball containment: Floating Ball Valve (class 150 and 300 up to 6 inches) and Trunnion Mounted BALL Valve. In terms of sealing type: METAL SEAT and SOFT SEAT types.

This group of products is produced in different sizes and classes as follows:

- \* Class 150 in sizes 4.3" to 28".
- \* Class 300 in sizes 4.3" to 36".
- \* Class 600 in sizes 2" to 16".
- \* Class 800 in sizes 2.1" to 1".
- \* Class 1500 in sizes 2.1" to 2".

**Founded:**

2005

#### Application:

- \* Complete disconnection and connection of current
- \* Preventing the return of passed liquids and gases
- \* Regulating the passage of the required amount of liquids and gases
- \* Adjusting and controlling the amount and pressure of liquids and gases
- \* Controlling and keeping pressure devices safe

*This product is final B2B equipment.*

#### Technical Specifications:

| Size          | Class       | Other Specifications  |
|---------------|-------------|---|
| 1.2 " to 40 " | 150 to 2500 | <ul style="list-style-type: none"> <li>* Fully Welded Body</li> <li>* Split Body</li> <li>* Full or Reduce Bore</li> <li>* Floating Ball or Trunnion Mounted Type</li> <li>* Side or Top Entry</li> <li>* Metal to Metal, PMSS, or Soft Seat</li> <li>* Fire Safe Construction</li> <li>* NACE MR 0175</li> </ul> |

#### International Standards or Permission:

- \* API 6D
- \* ISO 17292



## ➤ Control Valves with Pneumatic Actuator

◆ Rasta Group Control Valve Manufacturer

[www.rastagroup.net](http://www.rastagroup.net)



### Product Introduction:

In pneumatic systems, the energy transfer material is compressed air; as in hydraulic systems, hydraulic oil is controlled; in pneumatic systems, air must be controlled and directed. The pneumatic valve has the task of connecting and disconnecting, controlling the pressure, discharge, direction, quantity, etc., of the air passing through the system.

The two primary pneumatic actuators used in industrial valves are the diaphragm actuator and the piston actuator.

**Founded:**

2001

### Application:

Oil, gas, petrochemical and power plants industries

*This product is final B2B equipment.*

### Technical Specifications:

|                     |                          |
|---------------------|--------------------------|
| Actuator type       | Cylindrical or diaphragm |
| Size                | 75 ~ 600                 |
| Motion Range (inch) | 0.5 ~ 12                 |
| Pressure (bar)      | 4 ~ 7                    |

### International Standards or Permission:

- \* ISO 9001
- \* ISO 14001
- \* ISO 45001



## ➤ Trunnion Mounted Soft Seat Ball Valves

### ◆ Pishgam Industrial Equipment Designers Co.

[www.pishgam.co](http://www.pishgam.co)

**PISHGAM**  
INDUSTRIAL EQUIPMENT DESIGNERS

#### Product Introduction:

Ball valves work with a rotary motion. They are blocking or ducting members in the form of a hollow sphere or hemisphere that rotates around a vertical axis relative to the direction of fluid flow. As the valve stem turns to the open position, the ball or sphere rotates, and the hole in the middle of it is placed in the way of entering and exiting the fluid, and as a result, the fluid passes through the valve. Ball valves are produced in two types: multi-piece body and fully welded body. The main components of this type of valve include the body, cap, ball, shaft, seat ring, and components inside the valve with soft parts. Since they are generally used to disconnect and connect the flow path, ball valves are important to prevent explosions due to leaks in lines or flow interruptions to protect downstream equipment. The size and class of these valves:

- \* Class 150 valves from 24 inches and above
- \* Class 300 valves from 20 inches and above
- \* Class 600 valves from 16 inches and above
- \* Class 900 faucets of all sizes
- \* Class 1500 valves of all sizes
- \* Class 2500 valves of all sizes
- \* Valves class 5000 and above

#### Main Export Destinations:

Iraq, Azarbijan, Syria

#### Annual Production Capacity:

2000 valves

#### Founded:

2002

#### Application:

This type of valve controls the fluid flow, whether to close, open or change the route in pipelines and gas, oil, or petrochemical facilities.

*This product is final B2B equipment.*

#### Technical Specifications:

|                             |   |
|-----------------------------|---|
| <b>specification</b>        | API6A . API6D And non-Standard Design   |
| <b>Nominal Size(API 6A)</b> | 1 13/16" . 2 1/16" . 4 1/16" . 7 1/16" . 9" . 11"   |
| <b>Nominal Size(API 6D)</b> | Up to 56" in different classes  |
| <b>Rting</b>                | API6A#3000, #5000, #10000, #15000<br>ASMEClass#150, 300, 600, 900, 1500, 2500, 4500       |
| <b>Valve Type</b>           | Trunnion Mounted, Floating  |
| <b>Seat Seal Material</b>   | PTFE, NYLON, PEEK , METAL SEAT  |
| <b>Seal</b>                 | Viton A/B, Buna N, EPDM, PTFE, HNBR, KALREZ   |
| <b>Features</b>             | Anti Blowout Steam, Double Block and Bleed ,Anti Static Device, Locking Device, PMSS, DIB |
| <b>PSL</b>                  | 1, 2, 3   |
| <b>End Connections</b>      | Flanged and Butt Weld   |
| <b>Fire Safe Standard</b>   | API6FA, BS6755, API607  |
| <b>Overlay</b>              | Inconel, SS316  |
| <b>Operator</b>             | Handwheel, Gear, Pneumatic Actuator, Motor, Gas Over Oil                                  |

#### Advantages:

- \* excellent quality
- \* after sales service

#### International Standards or Permission:

API6D, API6A, ISG, IPS, ANSI, ASTM, EN, DIN, ISO



## ➤ Butterfly Valves

### ◆ Godakhtkar Industries Development and Renovation Co.



#### Product Introduction:

A ball valve is a quarter-turn valve whose flow blocking member is a perforated sphere that rotates around a vertical axis relative to the fluid flow direction. When the hole is aligned with the flow, the valve is open and when the hole is perpendicular to the flow, the valve is closed. When the handle of the valve is in line with the path, it is a sign that the valve is open, and when the handle is perpendicular to the direction of the flow, it is a sign that it is closed. Ball valves are valves that operate by a rotary motion, and a hollow spherical disc is used to control the flow. This type of valve is in the category of ON-OFF valves and its main components include the body, cap, hub, shaft, seat ring, and components inside the valve with soft and driving parts. Due to the fact that they are generally used to disconnect and connect the flow path, ball valves are of special importance in order to prevent accidents due to leaks in the lines or interruption of flow to protect downstream equipment.

Ball valves are divided into three categories from the point of view of how the spherical ball works:

- \* Floating Ball Valve
- \* Trunnion Mounted Ball Valve
- \* Rising Stem Ball valve

Trunnion model is a mode in which the spherical ball inside the valve is connected to the valve body by two anchor supports, this model of valves is suitable for fluids with high pressure. Also, this action calls for less force and torque needed to open or close the valve. This lower force becomes very important when an actuator is installed on the valve.

Ball valves are produced in sizes 2" to 56" and working class from 150 to 1500 according to API 6D standard and from 2" to 9" size and working pressure from 3000 PSI to 10000 PSI according to API 6A standard.

**Founded:**

2004

#### Application:

Fluid flow control

*This product is final B2B equipment.*

#### Technical Specifications:

|                               |   |
|-------------------------------|---|
| <b>Specification</b>          | API6A . API6D And non-Standard Design   |
| <b>Nominal Size(API 6A)</b>   | 1 13/16" . 2 1/16" . 4 1/16" . 7 1/16" . 9" . 11"   |
| <b>Nominal Size(API 6D)</b>   | Up to 56"   |
| <b>Rting</b>                  | API6A#3000,#5000,#10000,#15000<br>ASMEClass#150,300,600,900,1500,2500,4500                    |
| <b>Valve Type</b>             | Trunnion Mounted , Floating   |
| <b>Seat Seal Material</b>     | PTFE , NYLON , PEEK , METAL SEAT  |
| <b>Seal</b>                   | Viton A/B , Buna N , EPDM , PTFE , HNBR , KALREZ  |
| <b>Features</b>               | Anti Blowout Steam , Double Block and Bleed ,Anti Static Device , Locking Device , PMSS , DIB |
| <b>PSL</b>                    | 1 , 2 , 3   |
| <b>End Connections</b>        | Flanged and Butt Weld   |
| <b>Fire Safe Standard</b>     | API6FA , BS6755 , API607  |
| <b>Overlay</b>                | Inconel , SS316   |
| <b>Operator</b>               | Handwheel , Gear , Pneumatic Actuator , Motor , Gas Over Oil                                  |
| <b>Service</b>                | Standard Sour service , Low temp , Crygenic and high temp                                     |
| <b>Material Class(API6A)</b>  | AA , BB , CC , DD , EE , FF , HH  |
| <b>Temp Rating (API6A)</b>    | K , L , T , U , V   |
| <b>Body and Bonnet Mteril</b> | Forged AISI4130 , A105 , A350LF2/LF3 , A182F316/316L , Inconel625 , Super Duplex              |
| <b>Trim Material</b>          | 13%Cr , SS36/316L Duplex F55 and Inconel  |

#### International Standards or Permission:

API6D, ISG, IPS, ANSI, ASTM, EN, DIN, ISO



## ➤ Ball Valves with API Standard

◆ Caspian Valve Kadous Co.

[www.cvkvalve.com](http://www.cvkvalve.com)



### Product Introduction:

Ball valves are among the most important industrial valve and main equipment to block and regulate fluid flows (oil, gas, steam, etc.) in the petrochemical industry. These valves are rotational and the obturator is a hollow semi-sphere rotating around a vertical axis. As the stem turns to the open state, the sphere rotates and the hole in the middle of the sphere is placed into the flow inlet/outlet path, thus passing the flow. Ball valves are rotary motion valves in which the obturator is a small hollow sphere. These valves can be used for flow control but they are frequently used as on/off valves.

Our product includes two kinds of ball valves: multi-piece and fully welded bodies. The main components of ball valves include:

- \* Body and cover which maintain the pressure in the valve
- \* Ball which opens and closes the valve
- \* Seat Ring is where the ball sits
- \* Stem which is connected to the ball and moves it

The product is available in the following classes:

- \* Class 150 - sizes 2 to 10
- \* Class 300 - sizes 2 to 10
- \* Class 600 - sizes 2 to 4
- \* Class 900 - sizes 3

**Founded:**

2010

### Application:

Gas and hazardous fluid transmission lines

*This product is final B2B equipment.*

### Technical Specifications:

| Size        | Class       | Other Specifications  |
|-------------|-------------|---|
| 2 " To 36 " | 150 to 2500 | Fully Welded Body<br>Split Body<br>Full or Reduce Bore<br>Floating Ball or Trunnion Mounted Type<br>Side or Top Entry<br>Metal to Metal, PMSS or Soft Seat<br>Fire Safe Construction<br>NACE MR 0175<br>-40 to +200°C |

### Advantages:

- \* Preserving and improving the standard and expected specifications, especially the customer requested requirements
- \* Providing simple and cheap conditions compared to other manufacturers to change any product with any design to another product with a different design

### International Standards or Permission:

- \* API 6D
- \* BS 5351
- \* ASME B16.34
- \* ASME B16.5
- \* ASME B16.25
- \* API 6FA
- \* API 598



## ➤ Globe Valves with API Standard

◆ AsalAra Co.

[www.asalara.com](http://www.asalara.com)



### Product Introduction:

Globe valves are a kind of valve in which a truncated cone is responsible for opening/closing the valve or adjusting the flow. Compared to other kinds of valves, globe valves lead to a higher pressure drop, and they are usually employed for flow rate control. Globe valves are manufactured in a straight or angle shape. There are different classes for these valves:

- \* Class 150: 16 in. and higher
- \* Class 300: 12 in. and higher
- \* Class 600: 10 in. and higher
- \* Class 900: 6 in. and higher
- \* Class 1500 and 2500: all sizes

The flow blocking component (plug) is along the flow path, and flow symmetrically passes around the plug. The plug design and flow direction change enable the globe valve to control the flow. As the plug movement direction changes and the flow around the plug becomes symmetrical, the flow disturbances are controlled in the semi-closed condition. So, these valves allow for flow control without wear and vibration.

Different modules of the product and their technical specifications include:

**Body:** according to BS 1873 and ASME B16.34 limitations

**Bonnet:** made of the same material as the body, gearbox connection capable of turning into a handwheel and actuator

**Trim:** according to BS 1873 standard, all sealed surfaces in contact with the fluid are a part of the trim.

**Stem:** with a linear movement, which presses the disk to the seat

**Founded:**

1998

and seal packing by overcoming the fluid forces and friction.

**Back Seat:** When the valve is fully open, the stem is in contact with the back seat, providing sealing. Therefore, the valve packing can be replaced without leakage, any risk, and shutting down the line (repacking under pressure).

**Seat:** The seat material is the same as the body, according to BS 1873 standard. The sealing surface is coated by stellite welding wire. Ultimately, the seat ring is welded to the body.

**Disk:** The disk is designed as a one-piece body. As the stem moves vertically, the disk provides the sealing effect by coming in contact with the seat ring at the proper angle. The disk can be made in parabolic, ball, plug, and needle shapes per customer request.

**Gasket:** used at the body-bonnet interface to provide full sealing and prevent leakage.

**Packing:** sealing the stem at the stuffing box of the body

### Application:

- \* Passing, cutting off, and/or adjusting the flow
- \* Flow rate control

*This product is final B2B equipment.*

### Advantages:

Easy access to valve internal components for repair and maintenance

### International Standards or Permission:

- \* BS 1873
- \* API 598
- \* ASME B16.34

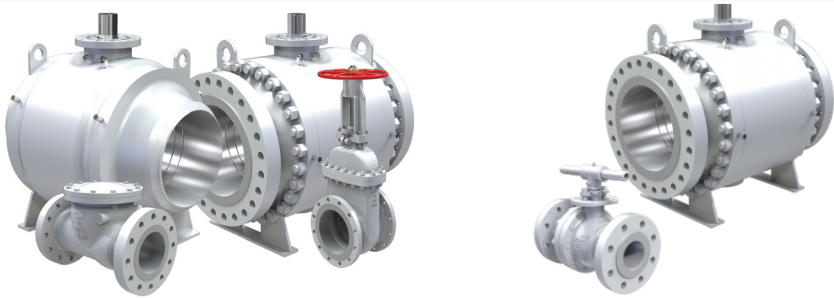
**Technical Specifications:**

| Specifications                |                         |
|-------------------------------|-------------------------|
| <b>Valve Type</b>             | Globe Valve             |
| <b>Rating</b>                 | 150 ~ 2500              |
| <b>End Connection</b>         | Flanged, RF, ASME B16.5 |
| <b>Size</b>                   | 2" ~ 24"                |
| Material For Construction     |                         |
| <b>Body</b>                   | ASTM A216 WCB           |
| <b>Bonnet</b>                 | ASTM A216 WCB           |
| <b>Trim</b>                   | Stellite                |
| <b>Stem</b>                   | A276 410/420 – A182 F6  |
| <b>Back seat</b>              | 13%Cr                   |
| <b>Seat</b>                   | A105 + Stellite         |
| <b>Wedge</b>                  | A105 + Stellite         |
| <b>Wedge Seat Surface</b>     | Stellite                |
| <b>Gasket</b>                 | Graphite + SS304        |
| <b>Bolting/Nuts</b>           | ASTM A193 B7, A19H 2    |
| <b>Packing</b>                | ASTM A182 F6            |
| Valve Construction            |                         |
| <b>Type</b>                   | OS & Y Type             |
| <b>Construction</b>           | Plug Type Disc          |
| <b>Stem</b>                   | Rising Stem             |
| <b>Special Requirement</b>    | Bolted Bonnet           |
| <b>Design Standard</b>        | BS 1873 / API 623       |
| <b>Test Pressure Standard</b> | API 598                 |
| <b>Face To Face Dimension</b> | ASME B16.10             |
| <b>Operator</b>               | Gear Operated           |
| Process Condition             |                         |
| <b>CWP</b>                    | 51.1 bar                |
| <b>Max Temperature</b>        | 538 °C                  |



Knowledge-based products and equipment





## ➤ Hydraulic and Pneumatic Actuators with Ball Valves

◆ Ardabil Industrial Valves Co.

[www.aiv-group.com](http://www.aiv-group.com)



### Product Introduction:

Actuators provide the force to move the internal parts of a valve for opening/closing the valve.

- \* **Pneumatic actuators:** These actuators are probably the most popular actuators in industrial valves because they are relatively cheap, and their required energy (compressed air) is readily available in most workshops. The pneumatic actuators are structurally simpler than electrical and hydraulic ones, which is another advantage due to easier repair and maintenance. Pneumatic actuators use air pressure to open or close the valve. These actuators can be used for linearly and rotationally moving valves with limited stroke length. Pneumatic valves can be employed for valves of various sizes.
- \* **Hydraulic actuators:** These actuators can produce large torques, and thus, they are the proper choice to operate large industrial valves. These actuators are significantly stable because they are used where pneumatic or electrical actuators are not feasible.

**Founded:**

2005

### Application:

Converting pressured fluid power into mechanical power

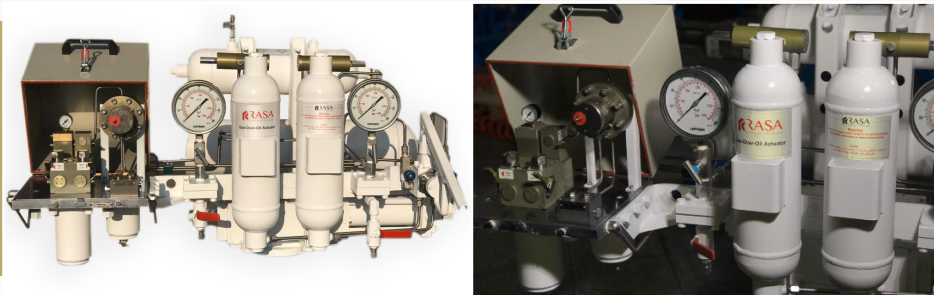
*This product is final B2B equipment.*

### Technical Specifications:

|                    |             |
|--------------------|-------------|
| <b>Size</b>        | 2-56 in.    |
| <b>Class</b>       | 150-2500    |
| <b>Temperature</b> | -29 to 85°C |
| <b>Pressure</b>    | 20-420 bar  |

### Advantages:

- \* Controlling the production process
- \* Remote access to valves and/or control equipment
- \* Cutting off the system actuator from a safe place during emergencies
- \* High torque needed for opening/closing the valve and safety issues



## ➤ Gas Over Oil Actuators

◆ Rasac Control Farayand Co.

[www.rasacf.com](http://www.rasacf.com)



### Product Introduction:

Most of the country's oil, gas, and petrochemical industries transport their products through pipelines to complete the production process or deliver the product. Therefore, constant control of the pipelines requires that a control system, which is directed through a base, has access to the entire line. We use actuators to open and close valves connected to gas lines in the gas industry. The operator or actuator is an element that is placed at the end of any control system. This part can, for example, by opening the valve, lead to the movement and control of the mechanism or system. The primary energy source of the actuator may be an electric current, hydraulic fluid pressure, or pneumatic pressure.

Gas-Over-Oil actuators are hydraulic actuators that use compressed gas to pressurize hydraulic oil and are usually used for ball valves. The main advantage of the Gas-Over-Oil actuator is that it is fed from the main line, and there is no need for a separate power source to open and close the valve.

**Annual Production Capacity:**

2500 pcs

**Founded:**

2019

### Application:

The primary function of this product is in gas pipelines.

*This product is final B2B equipment.*

### Technical Specifications:

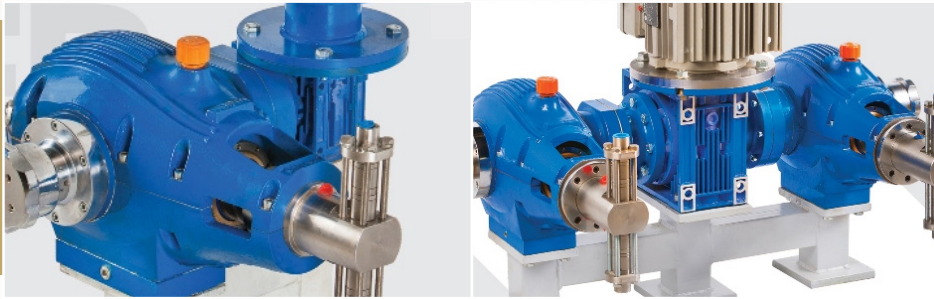
|                              |   |
|------------------------------|---|
| <b>Propulsion</b>            | Hydraulic - Pneumatic   |
| <b>Actuator Mechanism</b>    | Scotch - Yoke   |
| <b>Fluid</b>                 | Natural Gas / Nitrogen / Air                                    |
| <b>Working Temperature</b>   | -20 to 80°C   |
| <b>Feeding Pressure</b>      | 10 to 100 Bar   |
| <b>Maximum Torque</b>        | 200,000 N/m   |
| <b>Command Style</b>         | Manual Control/ Electric Control/ Compression ESD/ Electric ESD |
| <b>Installation location</b> | Pipeline's butterfly and ball valves                            |

### Advantages:

- \* Ability to automatically control and close the valve in case of failure in the pipe
- \* Ability to close the valve if the line pressure decreases or increases from the certain pressure
- \* Ability to remotely control electrically for actuators that are not easy to access
- \* Ability to quickly close the valve at the entrance of power plants
- \* Ability to quickly open the valve if needed

### International Standards or Permission:

- \* Testing and design of IGS-M-PL-007 standard
- \* BPVC Section VIII-Division 1 standard design tanks
- \* IP65 water ingress protection
- \* Designing the connection point of the operator to the valve according to the ISO 5211 standard
- \* BS-5493 (1977) coating standard
- \* ISO 3601 sealing parts standard
- \* ISO 7425 hydraulic cylinder design standard
- \* ISO 10100 hydraulic cylinders test standard
- \* ISO 11891 compression spring design and testing standard
- \* General tolerance standard I 2768



## ➤ Gas Over Oil and LBV Actuators

### ◆ Kondor Sanat Partian Industrial Group LTD (KSP)

[www.ksp-ig.com](http://www.ksp-ig.com)



#### Product Introduction:

The gas flow emergency hydraulic breaker is installed on these lines for the safety of gas transmission lines according to IGS standards. According to the sensitivity, this equipment has an appropriate time to close the installed valves, which according to the standard, is defined depending on the size of the valves. In case of improper operation of this equipment during an emergency, which may be caused by a drop in the line pressure due to its failure, there will be many life and environmental risks. In addition, it may cause many social and economic problems due to peak consumption and pressure drop caused by closing its valves.

Since these valves are often located in areas that are difficult to access, first of all, the control system of these valves is designed to provide the necessary power for their operation through the gas pressure in the pipelines. Also, remote control facilities to execute commands sent from the control room should be used along with the system. For this purpose, various operators are used. Gas Over Oil and Pneumatic are two types of actuators used next to the valves of gas and chemical pipelines.

#### Export History:

Up to 500,000 \$

#### Main Export Destinations:

Persian Gulf neighboring

#### Founded:

2008

#### Application:

It is used to prevent accidents and change the gas transmission route.

*This product is final B2B equipment.*

#### Technical Specifications:

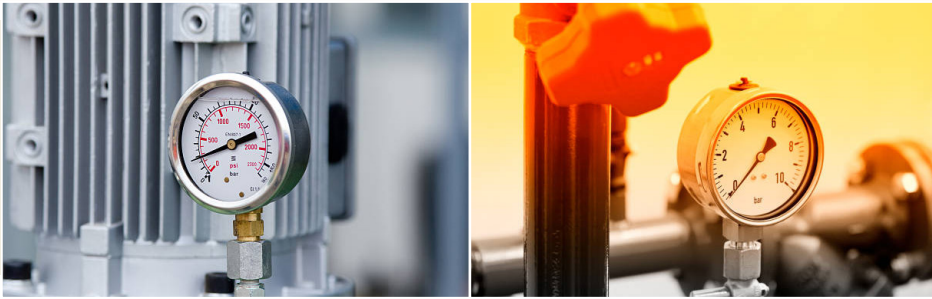
|                                 |  |
|---------------------------------|--|
| <b>Hydraulic (ram) Cylinder</b> | Creating power force to overcome valve torque          |
| <b>Arm Yoke</b>                 | It is the Ram power transfer arm to the valve coupling |
| <b>Sliders</b>                  | Aligning the ram and the yoke                          |
| <b>Hydraulic Parts</b>          | Logic commands in the logic circuit of the system      |

#### Advantages:

The technical knowledge of these products was carried out through research and development in Iran. In the design and manufacture of the actuators, the reverse engineering method was used (Rotork (in England) and Leden (in Italy) companies).

#### International Standards or Permission:

- \* Ministry of Petroleum of Iran approval
- \* Maroon oil and gas exploitation approval
- \* National Iranian south oil company approval



## ➤ Gas and Liquid Metering System

### ◆ Asia Instrument Co. LTD

[www.asia-instruments-ltd.com](http://www.asia-instruments-ltd.com)



#### Product Introduction:

Flow measurement is one of the major topics in engineering, which is nowadays especially important in oil, gas, refining, and petrochemical industries for optimal process control. In oil, gas, and petrochemical industries, metering systems refer to systems measuring the volume or mass of a fluid (e.g., gas, liquid, or two-phase flows). Based on their measurement accuracy, safety, reliability, and repeatability, the metering systems are divided into two categories: process flow and custody transfer measuring devices. There is a wide range of methods for flow measurement. The proper method is chosen based on the fluid, process condition, and limitations. Some metering systems include:

- \* Liquid and gas metering systems based on turbine flowmeters
- \* Liquid and gas metering systems based on ultrasonic flowmeters
- \* Liquid and gas metering systems based on Coriolis flowmeters
- \* Gas metering systems based on orifice flowmeters
- \* Liquid metering systems based on metered or PD flowmeters

**Founded:**

1994

#### Application:

- \* Delivery stations between companies
- \* export docks
- \* delivering oil, gas, or petrochemical products to ships, gas export stations

*This product is final B2B equipment.*

#### Technical Specifications:

|   |   |
|---|---|
| <b>Piping specifications</b>                      | The system is composed of a 48-in. header and 6 to 20-in. pipelines, including 5 operating lines and a master line. The master line is connected to other lines through a z-shaped connection. A gas metering system is used for calibration. |
| <b>Allowable pressure drop and fluid velocity</b> | It is an important factor for system sizing. For our product, the allowable velocity is 10 to 12 m/s.   |
| <b>Allowable flow rate for the system</b>         | It is in the range of 20 to 80% of the flowmeter capacity, which is 200 to 2,000 m <sup>3</sup> /h for the system.  |
| <b>Accuracy</b>                                   | 0.02%   |

#### Advantages:

- \* Accurate engineering calculations and sizing of meters, pipes, and valves so that the minimum pressure drop is achieved in the system
- \* Designing, manufacturing, and programming the control system and flowcomputers
- \* Designing and manufacturing meters used in metering systems
- \* Calculations for calibration devices and manufacturing meter provers

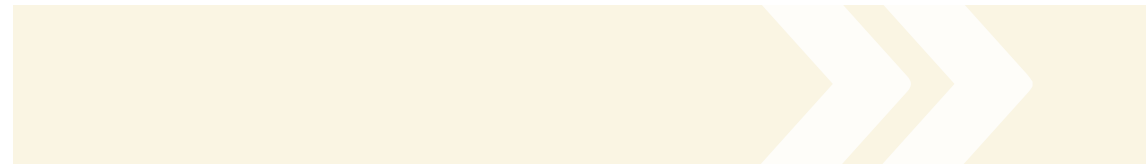
#### International Standards or Permission:

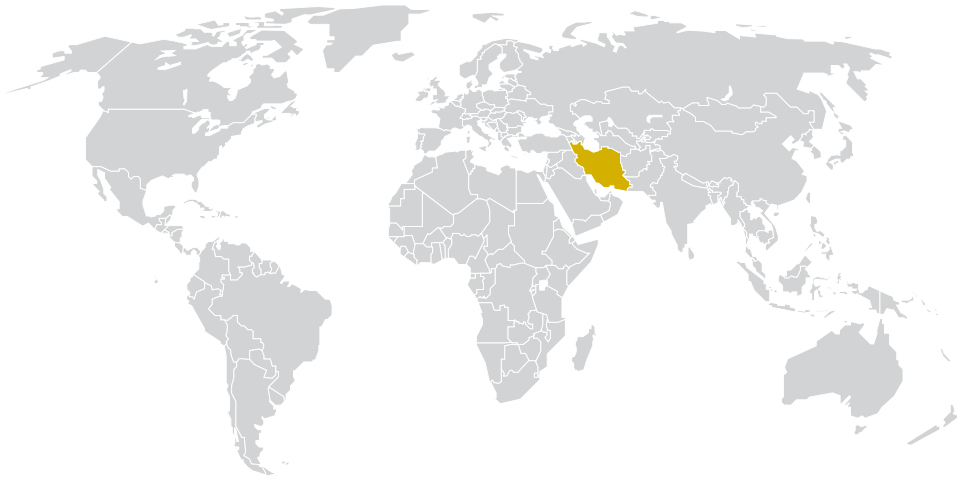
- \* AGA
- \* API
- \* Qualification certificate for design and production of metering systems
- \* Hi-Tech certificate for metering systems



### **Iran House of Innovation and Technology (iHiT)**

Iran House of Innovation and Technology (iHiT) is one of the types of export intermediaries that launched under the auspices of the Vice President for Science and Technology in Kenya, China, Russia, Turkey, Syria and Iraq. In addition to accessing the export instructions, these houses provide variety of services for companies to enter the interactional service markets such as: private and shared workspace, permanent exhibition of products, finding business partners and investing in the target countries of export, company registration, product registration, medicine, medical equipment and trademarks registration, dispatch and admission of business delegations, hiring local specialists to present products and service.





## TEHRAN iHiT

**Manager:** Mohammad Karami

**Field of Activity:** Permanent International Exhibition | Export of products and services of knowledge-based, creative and technology companies in Tehran

**Country:** Islamic Republic of Iran – Tehran

### Services:

- Holding permanent exhibition of knowledge-based products and services
- Holding specialized events and meetings
- Providing dedicated and shared workspace in Tehran
- Identifying export opportunities
- Identifying opportunities for scientific, technological and industrial cooperation

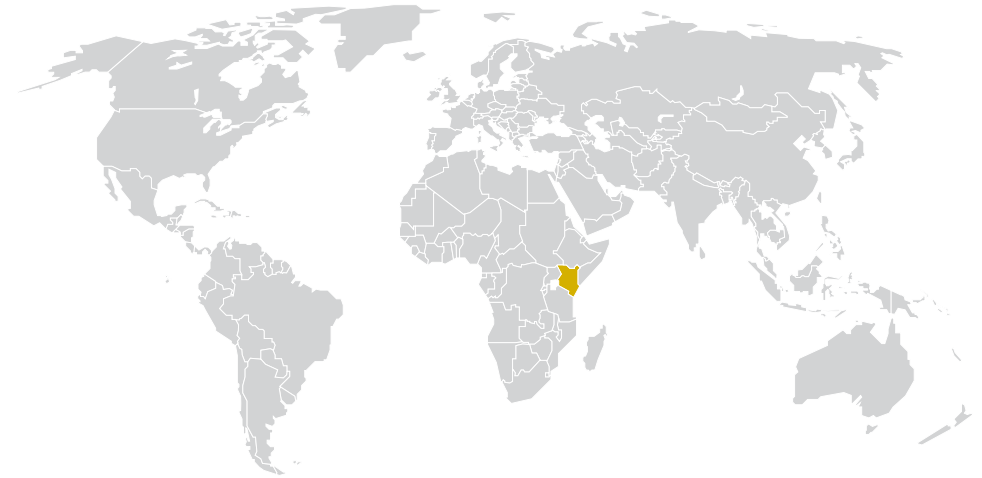
**Address:** Hall 37A, Tehran International Exhibition, Tehran, Iran

**website:** [www.ihit-expo.com](http://www.ihit-expo.com)

**Tel No:** (+98) 912 444 9958 / (+98) 21 910 737 37

**Supervisor:** Mohammad Mahdi Agharafiee

**Office Phone:** (+98) 912 706 9611



## NAIROBI iHiT

**Manager:** Ali Baniamerian

**Field of Activity:** Export of products and services of knowledge-based, creative and technology companies

**Country:** Republic of Kenya – Nairobi

### Services:

- Holding Permanent exhibition of products and services
- Providing dedicated and co-working space
- Holding the National Pavilion of the Islamic Republic of Iran in international exhibitions
- Export development of knowledge-based products
- Identifying opportunities for scientific, technological and industrial cooperation
- Providing export instructions of the Center for International Science and Technology Cooperation

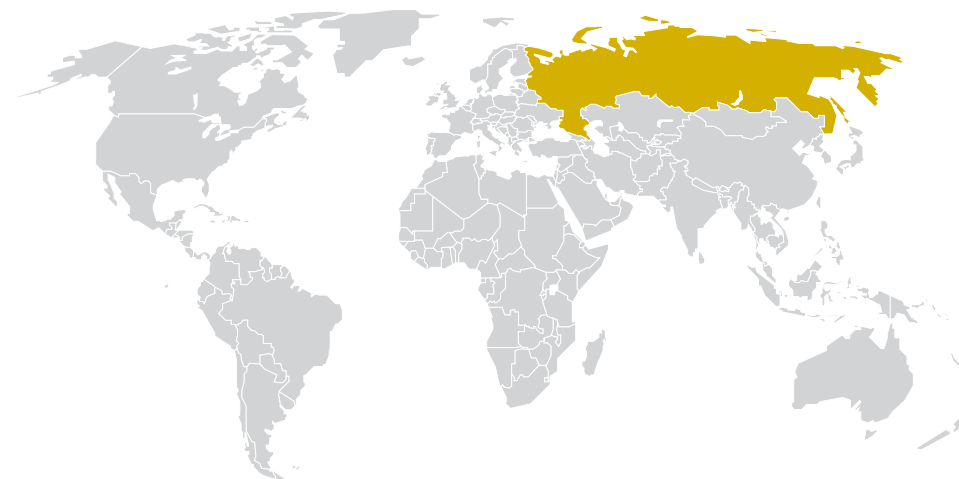
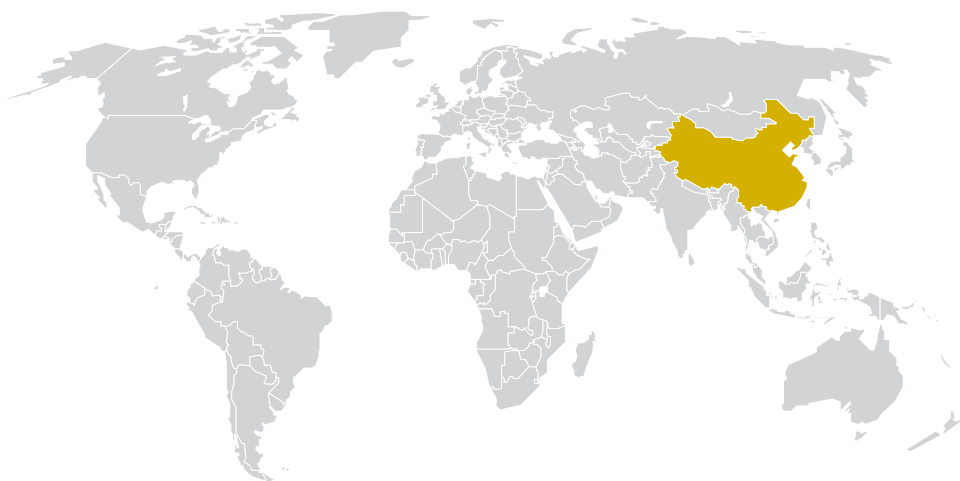
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## SUZHOU iHiT

**Manager:** Amir Ghorbanali

**Field of Activity:** Export of products and services of knowledge-based, creative and technology companies

**Country:** People's Republic of China - Shanghai

### Services:

- Holding Permanent exhibition of products and services
- Export development of knowledge-based products
- Providing dedicated and co-working space
- Identifying opportunities for scientific, technological and industrial cooperation
- Holding the National Pavilion of the Islamic Republic of Iran in international exhibitions
- Providing export instructions of the Center for International Science and Technology Cooperation

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**Tel No:** (+86) 182 062 123 92

**Supervisor:** Simin Rafeapour

**Office Phone:** (+98) 935 841 44 22

## MOSCOW iHiT

**Manager:** Mahdi Deilam Salehi

**Field of Activity:** Export of products and services of knowledge-based, creative and technology companies

**Country:** Russian Federation – Moscow

### Services:

- Holding Permanent exhibition of products and services
- Providing dedicated and co-working space
- Holding the National Pavilion of the Islamic Republic of Iran in international exhibitions
- Export development of knowledge-based products
- Identifying opportunities for scientific, technological and industrial cooperation
- Providing export instructions of the Center for International Science and Technology Cooperation

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## ISTANBUL iHiT

**Manager:** Masoud Hasani

**Field of Activity:** Export of products and services of knowledge-based, creative and technology companies

**Country:** Turkey – Istanbul

### **Services:**

- Holding Permanent exhibition of products and services
- Providing dedicated and co-working space
- Holding the National Pavilion of the Islamic Republic of Iran in international exhibitions
- Export development of knowledge-based products
- Identifying opportunities for scientific, technological and industrial cooperation
- Providing export instructions of the Center for International Science and Technology Cooperation

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**Supervisor:** Masoud Hasani

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## DAMASCUS iHiT

**Manager:** Mohammad Hadi Zeighami

**Field of Activity:** Export of products and services of knowledge-based, creative and technology companies

**Country:** Syrian Arab Republic – Damascus

### **Services:**

- Holding Permanent exhibition of products and services
- Providing dedicated and co-working space
- Export development of knowledge-based products
- Identifying opportunities for scientific, technological and industrial cooperation
- Holding the National Pavilion of the Islamic Republic of Iran in international exhibitions
- Providing export instructions of the Center for International Science and Technology Cooperation

**Address:** Damascus Freezone, Jamarag Sq., Damascus, Syria

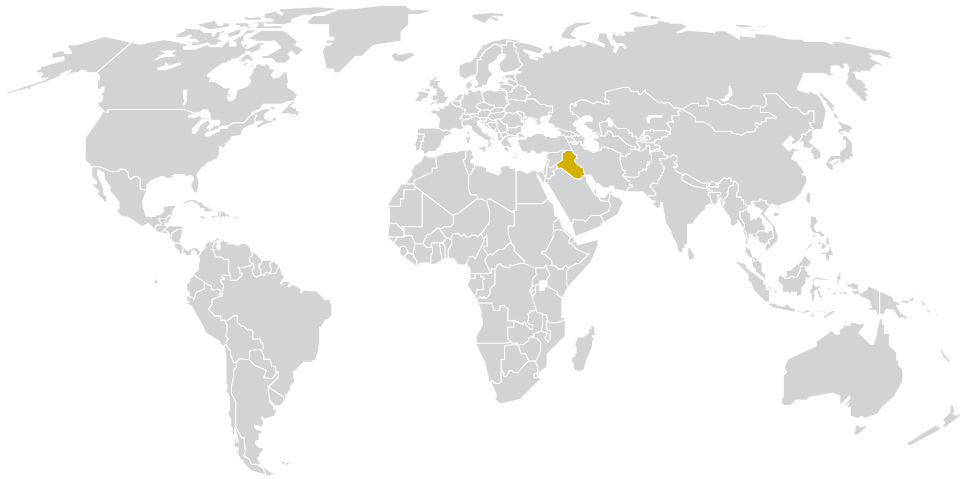
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**Supervisor:** Hasan Tahmasebi

**Office Phone:** (+98) 21 631 033 15





## Iraq (Sulaymaniyah) iHiT

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**Manager:** Hossein Salmani

**Field of Activity:** Export of products and services of knowledge-based, creative and technology companies

**Country:** Iraq, Sulaymaniyah

**Services:**

- Holding Permanent exhibition of products and services
- Providing dedicated and co-working space
- Holding the National Pavilion of the Islamic Republic of Iran in international exhibitions
- Export development of knowledge-based products
- Identifying opportunities for scientific, technological and industrial cooperation
- Providing export instructions of the Center for International Science and Technology Cooperation

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**Supervisor:** Mohammad Mahdi Alebouyeh

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