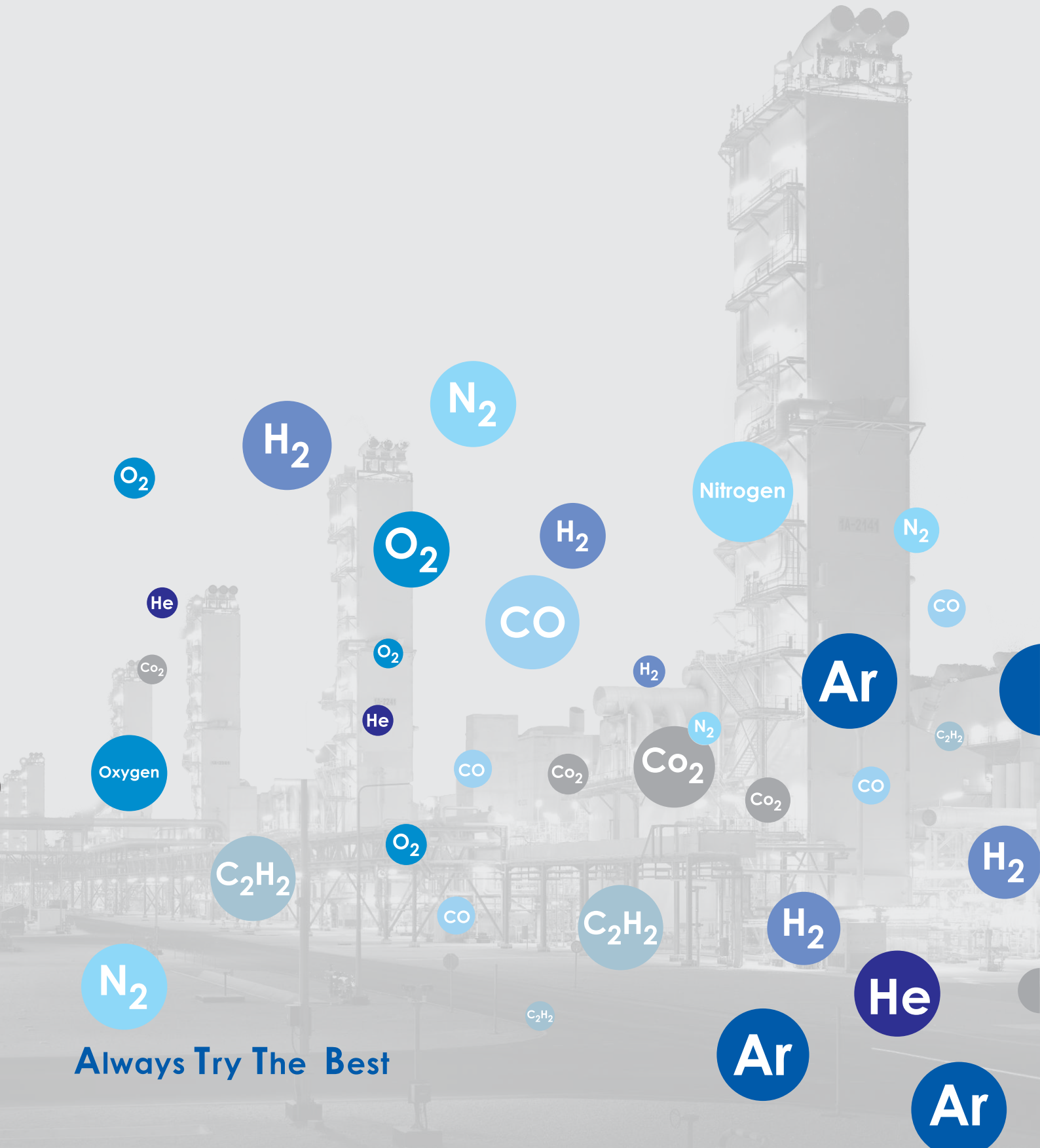


HAVAYAR

INDUSTRIAL GROUP

Gas Generation Gas Purification



Always Try The Best

Ar

EPC Projects



Engineering

Havayar has certified and expert engineers to design, prepare and submit technical documents based on international standards.

Activities: Feasibility Study, Conceptual Design, Basic Design, Front End Engineering & Design (FEED), Detail Engineering Field, Engineering services (FES).



Procurement

Havayar procurement team within Iran Office and affiliated Offices carry out procurement of Equipment for Projects, supervising all phases of activities such as: solicitation of quotation, purchase order, expediting, inspection and shipping.



Engineering

Havayar as a one of the best manufacturer in Iran, has the facilities & abilities to produce fixed & Rotary Equipment, Process Packages such as ASU, PSA, GSU, Turbo Expander, Air & Gas Compressors and etc.....



Construction

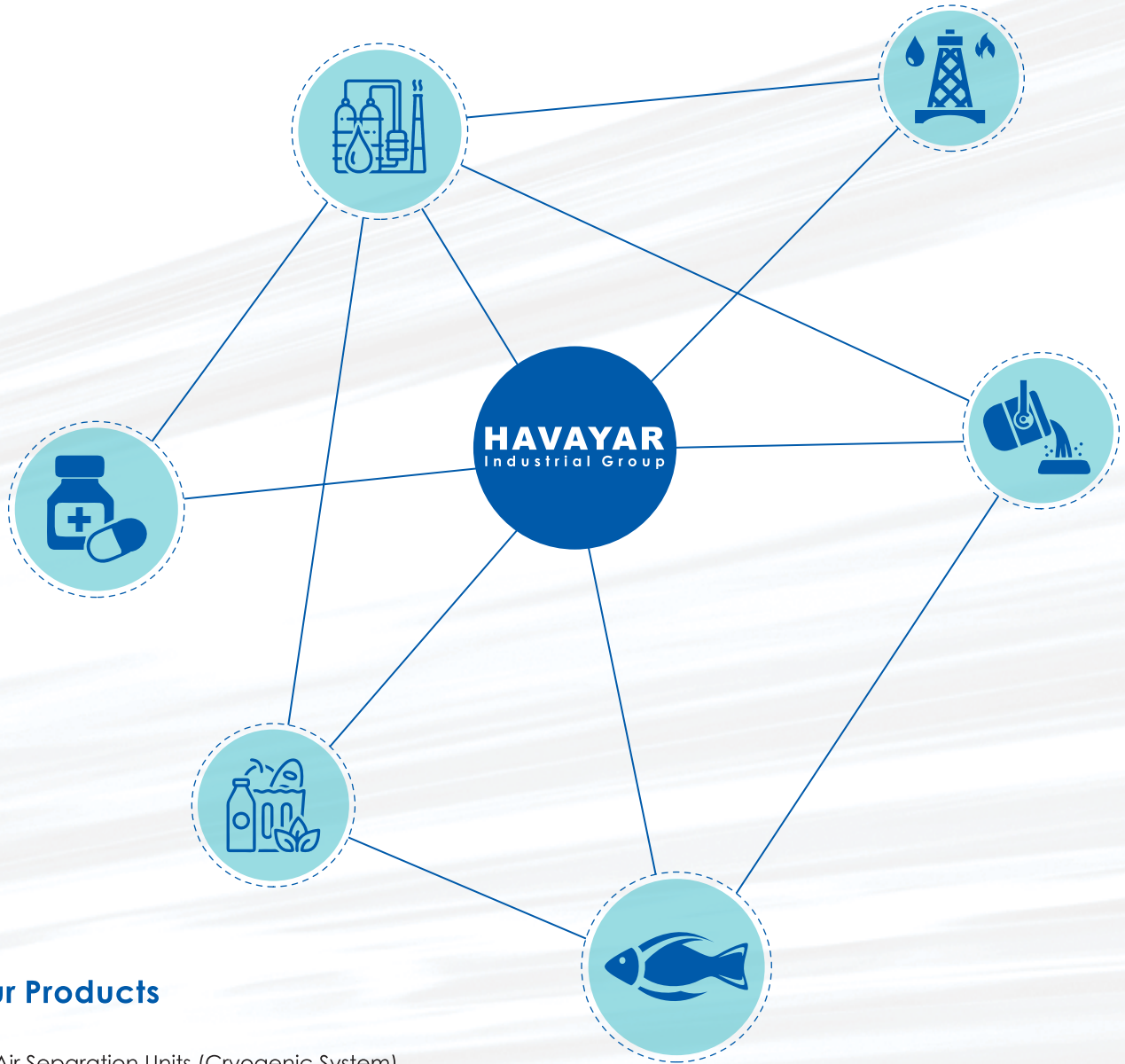
Construction team is basically responsible for defining and monitoring the construction works execution procedures, quality standards and quantity measurement requirements as well as defining HSE requirements.



After Sales

Havayar has certified and trained expert engineers for Commissioning, Start Up and After Sales Services for whole the Packages.





Our Products

- Air Separation Units (Cryogenic System)
- N₂ & O₂ Generator (PSA, Membrane)
- Hydrogen Production Unit (H₂ Reformer)
- Hydrogen Recovery unit (HRU/ PSA H₂)
- Hydrogen Generator (Electrolyzer System)
- HYCO (Hydrogen / Co) Plant
- CO & CO₂ Production & Recovery Unit
- Gas Cold Box
- GTL & Mini LNG Packages
- Fuel Oil Desulphurization
- Flare Gas Recovery Packages
- Liquid Storage Tanks (LIN, LOX, LAR)
- Cryogenic Pumps
- Aluminum Plate – Fin Heat Exchanger
- Laboratory H₂, N₂, O₂ Generators
- Supplying Spare Part for all above Products

Air Separation Unit (Cryogenic)

Nitrogen, Oxygen, Argon (Liquid – Gas)



Havayar Cryogenic Air Separation Technology are designed for production of Liquid and/or Gases Oxygen, Nitrogen & Argon from Atmospheric Air based on the low-temperature Rectification process. Our Cryogenic Air Separation Plant produce tons of O₂, N₂ & AR efficiently and safely 24 hr/day, 7 days/week, 365 days/year. We offer our products under license of ASME, DIN, EN, API, European Standard & IEC.

Why Havayar:

- More than 15 years experience in Oil, Gas and Petrochemical Companies
- Most Sales References in South Pars Gas Field and Refineries
- Production & Start-up of the Cryogenic & Air Compressor Packages in the greatest Refinery in Middle East (Persian Gulf Star Refinery)
- Manufacturing more than 45% of the packages inside Havayar factory
- Possibility to giving advice for Designing & Revamping the new Packages/ Existing Packages
- Presenting in All Approved Vendor List such as NPC, NIOC, NIEC, COFC, NIOEC, NISC, ...
- Possibility for Installation, Commissioning & Start Up and After Sales Services with certified & Expert Engineer

Package Features:

Capacity:

O₂: up to 200.000 Nm³/hr

N₂: up to 200.000 Nm³/hr

Ar: up to 1.000 Nm³/hr

Purity:

O₂: 99.99%

N₂: 1 ppm O₂ Impurity

Ar: 99.999%

- **Production Flexibility**
Regarding Flow, Purity & Pressure
- Design for long lifetime
- Full Automation & Remote Control
- Completely Pre-Fabricated Skids
- Low Power Consumption Multi-Duty Operation
- Possibility to Produce Liquid & Gas of N₂, O₂ & AR Simultaneously
- After Sales Services for more than 15 Years
- Availability of Spare Parts

Air Separation Unit (PSA System) (Nitrogen, Oxygen)



Our team of highly skilled professionals provides all the flexibility required to develop and design N₂ & O₂ Generators. We offer our products under license of ASME, DIN, EN, API, European Standards and IEC.

Nitrogen Generator consists of 2-Beds filled with Carbon Molecular Sieves. When compressed air is passed, Nitrogen comes out as product gas from one bed while other bed is simultaneously regenerated by depressurization to atmospheric pressure. This process is called "PRESSURE SWING ADSORPTION (PSA)".

Why Havayar:

- More than 15 years experience in Oil, Gas and Petrochemical Companies
- Most Sales References in South Pars Gas Field and Refineries
- Production & Start-up of the PSA & Air Compressor Packages in the greatest Refinery in Middle East (Persian Gulf Star Refinery)
- Manufacturing more than 45% of the packages inside Havayar Factory
- Possibility to giving advice for Designing & Revamping the new Packages/ Existing Packages
- Presenting in All Approved Vendor List such as NPC, NIOC, NIEC, COFC, NIOEC, NISC ...
- Possibility for Installation, Commissioning start up and After Sales Services with certified & Expert Engineers



Package Features:

Capacity:

O₂: up to 10.000 Nm³/hr

N₂: up to 10.000 Nm³/hr

Purity:

O₂: up to 95%

N₂: up to 1 ppm O₂ Impurity
(99.9999%)

- **Production Flexibility Regarding Flow, Purity & Pressure**
- **Completely Pre-Fabricated Skids**
- **Full Automation & Remote Control**
- **Minimized Maintenance and Operation Costs**
- **Package could be located in Container as Portable Package**
- **Design for long life time**
- **After Sales Services for more than 15 Years**
- **Availability of Spare Parts**

Hydrogen Generator / Hydrogen Production



Our delivery program offers three production processes for the Generation of Hydrogen:

HC: Steam Reforming

HM: Methanol Reforming

EL: Electrolyzer

All plants are supplied as completely Pre-Assembled Skid-Mounted Units, which are partially dismantled for transportation.

Havayar Hydrogen Generator Packages are designed and equipped for fully Automatic Operation.

Personnel Supervision and Maintenance needed are minimized. Start-up, Operation and Shut-Down of the plant are carried out by push button Operation by a PLC system. The Plants can be supported over large distances via MODEM.

Electrolyzer Systems are available in both Laboratory & Industrial Design with possibility to produce Oxygen & Hydrogen simultaneously.



Package Features:

Capacity of Reformer:

Up to 200.000 Nm³/hr

Capacity of Electrolyzer:

Up to 500 Nm³/hr

Purity:

Up to 99.9999 %

- **Production Flexibility Regarding Flow, Purity & Pressure**
- **Full Automatic Operation & Remote Control**
- **Cost Efficiency**
- **Easy Installation and Maintenance**
- **Completely Pre-Fabricated Skids**
- **After Sales Services for more than 15 Years**
- **Availability of Spare Parts**
- **Low Power Consumption**
- **Optimal Process Cycle Design**
- **Minimum Delivery Time**

Hydrogen Recovery and Purification Unit (HRU)

PSA Method



Hydrogen can be recovered by the pressure swing system from very different feed gases, e.g.:

- Synthesis Gas from Steam Reforming, partial Oxidation or Gasification processes
- Hydrogen-Rich Refinery Off-Gases
- Ethylene Off-Gases
- Methanol and Ammonia purge gases
- Coke Oven Gases

Due to the flexibility of the control system, the Hydrogen Purification Packages can be adapted to a certain change in Feed Gas composition or temperature.

Havayar participate with Global H₂ PSA Packagers use the most advanced absorbents on the market with patented cycles that are optimized for recovery and productivity rates. The units are made for outdoor and unmanned operation, and are designed to be both compact and fully skid-mounted.

Havayar Industrial Group is a leading supplier for plant engineering and construction in partnership with most well-known International Companies. Our services are built on our extensive partnership expertise in the planning project development and construction of turnkey industrial plants.

We focus on plants for the Purification of Hydrogen compatible with variable Feed Gas (such as Olefins, Heavy Hydrocarbons and ...)

Also Havayar have the possibility to giving advice for Designing & Revamping the new Packages/ Existing Packages.

Package Features:

Capacity:

Up to 200,000 Nm³/hr

Purity:

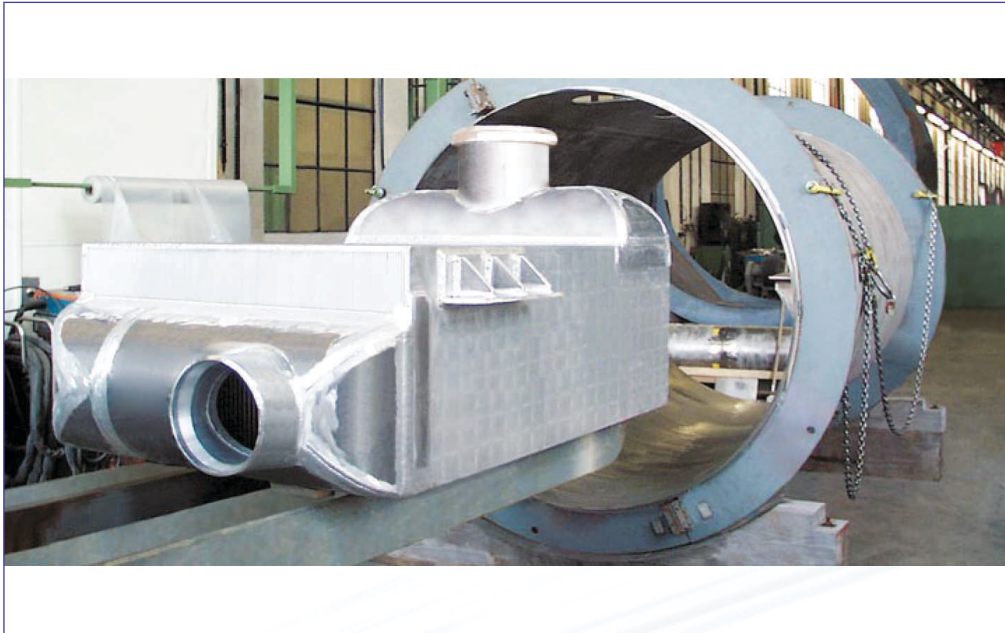
Up to 99.999%

Pressure:

Minimum 5 barg Up to 300 barg

- No Limitation in feed Gas & Production Pressure
- No Limitation in feed Gas & Production Composition
- Easy Maintenance
- Hydrogen Recovery up to 95%
- Full Automation & Remote Control
- Completely Pre-Fabricated Valve Skids
- Possibility to Revamp Existing Packages Recovery purity & Capacity of Hydrogen
- After Sales Services for more than 15 Years
- Availability of Spare Parts

Gas Separation and Purification Unit (Gas Cold Box) Including Aluminum Plate-Fin Heat Exchangers



Gas Cold Box

An economic alternative, which saves time during site work, is the installation of different exchangers in a steel containment (Cold Box). Interconnecting piping, vessels, valves and instrumentation are included in this packaged unit to form, after filling with insulation material (perlite), a ready-to-operate unit.

Beside others the main application are:

- Petrochemical Plants
- Gas Treatment Plants
- Natural Gas Liquefaction Plants
- Air Separation Plants
- Helium Liquefaction Plants

Aluminum Plate-Fine Heat Exchanger

These units are key components in many process plants. Each aluminum plate-fine heat exchanger is specially designed for the required thermal and hydraulic performance thus providing a tailor made and very economic process equipment.

Plate-fine heat exchangers can treat many process streams in only one unit thus avoiding expensive interconnecting piping of different units.

Package Features:

Design temp:

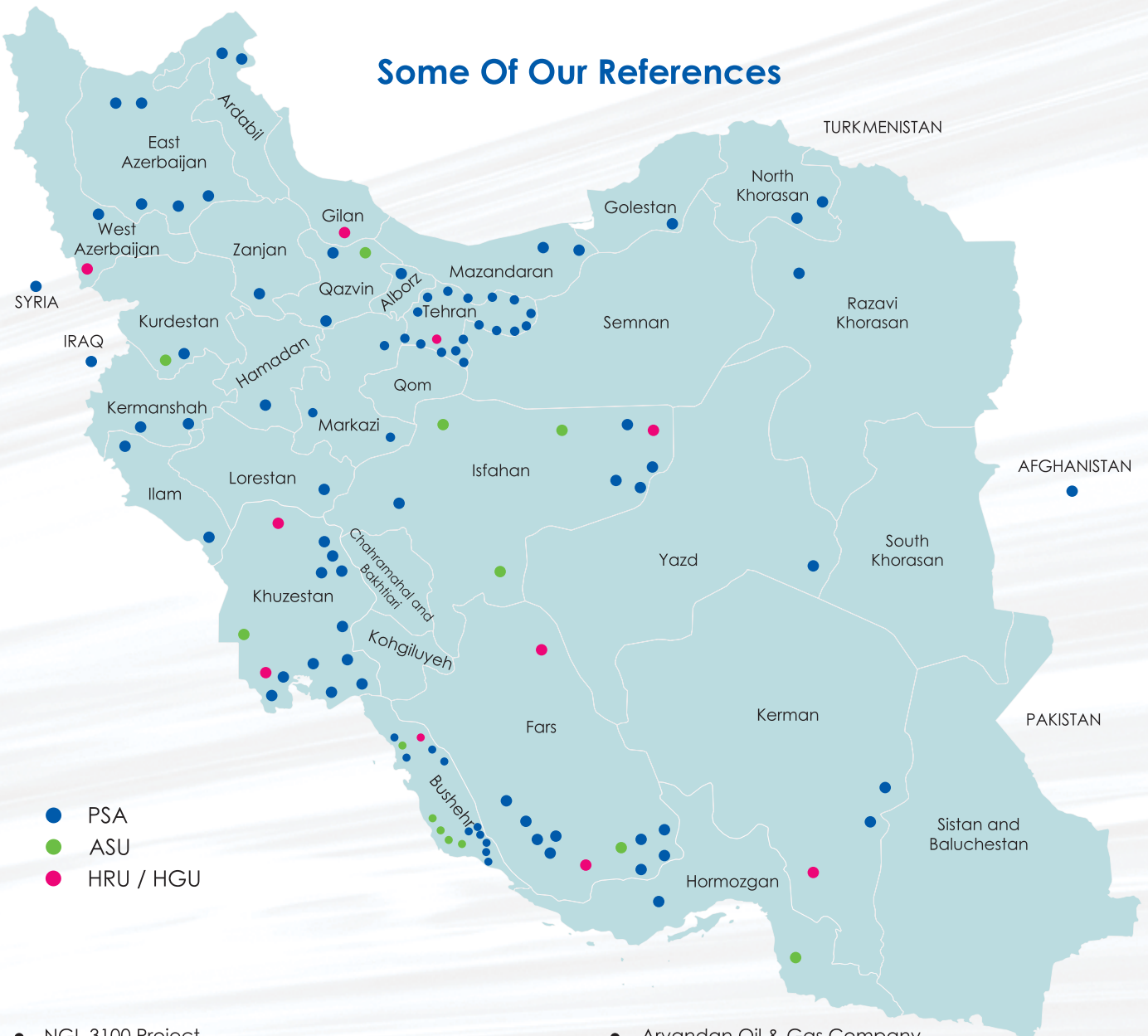
-269 °C up to 93 °C

Design Pressure:

Up to 130 bar

- Easy Maintenance
- Full Automation & Remote Control
- Based on International Standards such as:
ASTM – ASME – ANSI –
DIN – EN
- Low Weight Aluminium Design
- Low Pressure Drops
- Highly Efficient Heat Transfer
- Very Compact Design in Comparison with Conventional Heat Exchanger Type

Some Of Our References



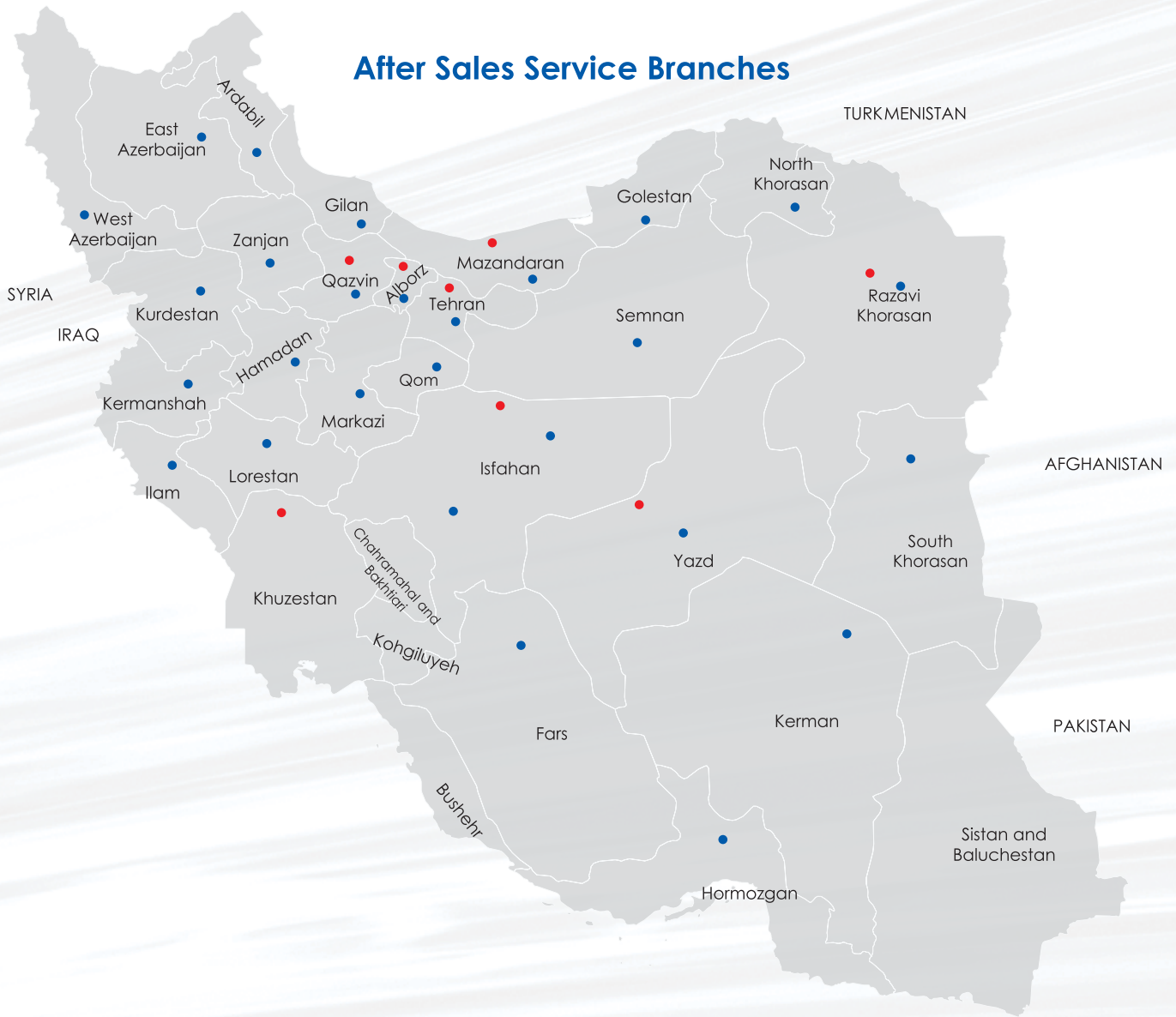
- NGL-3100 Project
- NGL-3200 Project
- Tabriz Oil Refinery
- Tehran Oil Refinery
- Isfahan Oil Refinery
- Kangan Oil Refinery
- Parsian Gas Refinery
- Abadan Oil Refinery
- Sarvak Azar Oil Field
- Bid Boland Oil Refinery
- Bandar Abbas Oil Refinery
- Khuzestan Steel Company
- Hormozgan Steel Company
- PGOC- South Pars -Phase 2&3
- Babak Mes Iranian Company
- Arvandan Oil & Gas Company
- Tabriz Petrochemical Company
- Pardis Petrochemical Company
- Ahwaz National Steel Company
- Pardis Petrochemical Company
- Nargesi Oil Field Project – NISOC
- Bistoon Petrochemical Company
- PGSOC- Persian Gulf star Refinery
- Maroon Petrochemical Company
- Kurdistan Petrochemical Company
- Khomein petrochemical company
- POGC- South Pars -phase 13, 14, 19 & 20-21
- Masjed Soleiman Petrochemical Company
- West Ethylene Projects (Ahwaz, Sanandaj, Poldokhtar, Piazabad, Assaluyeh)

Approved Vendor List



- Pars Oil Company
- Razi Petrochemical Company (RPC)
- Tehran Oil Refinery Company (TORC)
- National Iranian Oil Company (NIOC)
- National Iranian Steel Company (NISC)
- National Iranian Gas Company (NIGC)
- Persian Gulf Star Oil Company (PGSOC)
- National Petrochemical Company (NPC)
- Iran's Central Oil Fields Company (ICOFC)
- National Iranian South Oilfields Company (NISOC)
- Iran Power Project Management (Mapna Group)
- Oil Industries' Engineering and Construction (OIEC)
- National Iranian Copper industries Company (NICI)
- National Iranian Oil Engineering & Constriction (NIOEC)
- Iranian Gas Engineering and Development Co (IGEDC)
- Persian Gulf Petrochemical Industries Company (PGPIC)
- Petroleum Engineering & Development Company (PEDEC)

After Sales Service Branches



- Fars
- Ilam
- Qom
- Yazd
- Gilan
- Alborz
- Tehran
- Zanjan
- Qazvin
- Ardabil
- kerman
- Markazi
- Isfahan
- Semnan
- Lorestan
- Khashan
- Golestan
- Golsestan
- Hamedan
- khuzestan
- Kurdistan
- Hormozgan
- kermanshah
- Mazandaran
- East Azerbaijan
- North Khorasan
- Razavi Khorasan
- South Khorasan
- West Azerbaijan



شرکت هوایار از تیر ماه سال ۱۳۷۷ به منظور تولید کمپرسورهای صنعتی و تجهیزات جانبی هوای فشرده در ایران فعالیت خود را شروع کرد و با بهره گیری از مشاورین داخلی و خارجی سطح کیفی محصولات خود را به بالاترین درجه ممکن رساند. هم اکنون این شرکت با کسب جدیدترین دانش فنی و تخصصی و پیشرفته ترین فن آوری جهانی و با مجموعه ای بالغ بر ۴۰۰ نفر از کارشناسان کارآزموده، در کارخانه ای به مساحت ۳۰۰۰ مترمربع، در راستای اهداف متعالی خود فعالیت می نماید.



Havayar factory Karaj - Iran



از اهداف مهم و اصلی شرکت هوایار می توان به موارد زیر اشاره کرد: ۱- مشتری مداری ۲- ارتقاء مداوم کیفیت ۳- گسترش خدمات پس از فروش در راستای تحقق اهداف فوق، این شرکت موفق به دریافت گواهینامه IMS (مدیریت یکپارچه کیفیت، ایمنی و محیط زیست) مبتنی بر آخرین ویرایش استانداردهای جهانی ISO 9001:2015, ISO 14001:2015 و OHSAS 18001:2007 از شرکت IMQ ایتالیا، گواهینامه محصول با کیفیت از ICS Group کانادا و همچنین عضویت در شبکه جهانی کیفیت IQNet گردیده است.

CA28-001/02

HAVAYAR
INDUSTRIAL GROUP

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