

# BBS

Design & Manufacture of  
Oil and Gas Equipment



Quality manufacturing  
is a system,  
Not just a slogan.



BBS, an eye for excellence

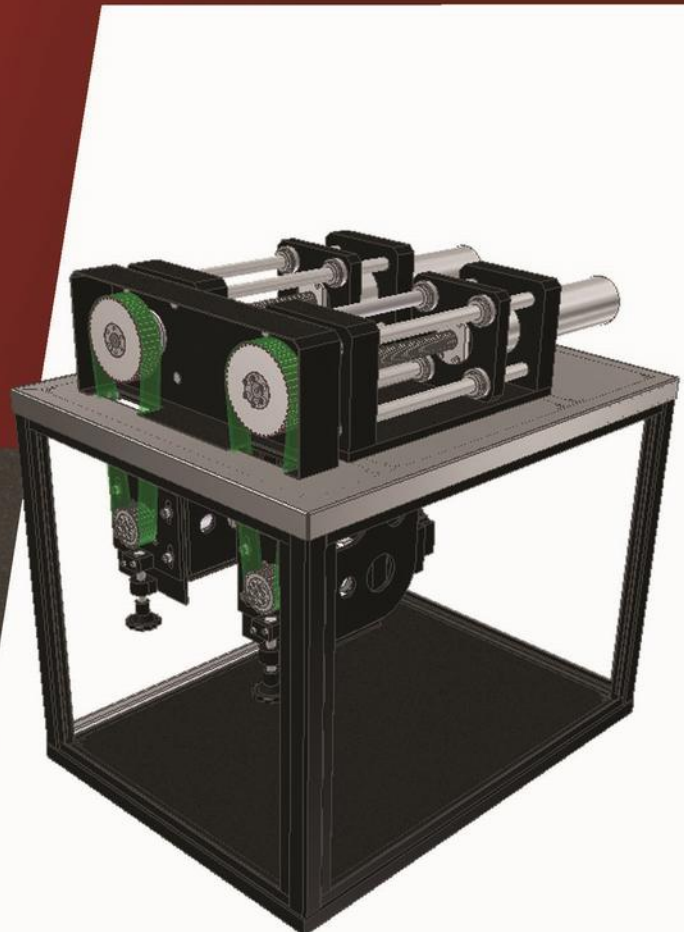


## Introduction:

BBS Company is one of the prominent companies in the field of designing and manufacturing of oil and gas laboratory equipment in Iran. With taking advantage of several years' experience and specialized people, we manufacture high technology equipment for routine and special core analysis, EOR, PVT, drilling, stimulation test, and university training laboratories.

The result of these activities are the products that are of interest to many domestic and foreign customers. By applying up to date standards, criteria and algorithms designed by BBS experts, high quality and reliable equipment have been created.

Controlling of all processes from idea to manufacturing is the main concern of BBS managers, and on this basis, the current technical knowledge in the company is established.

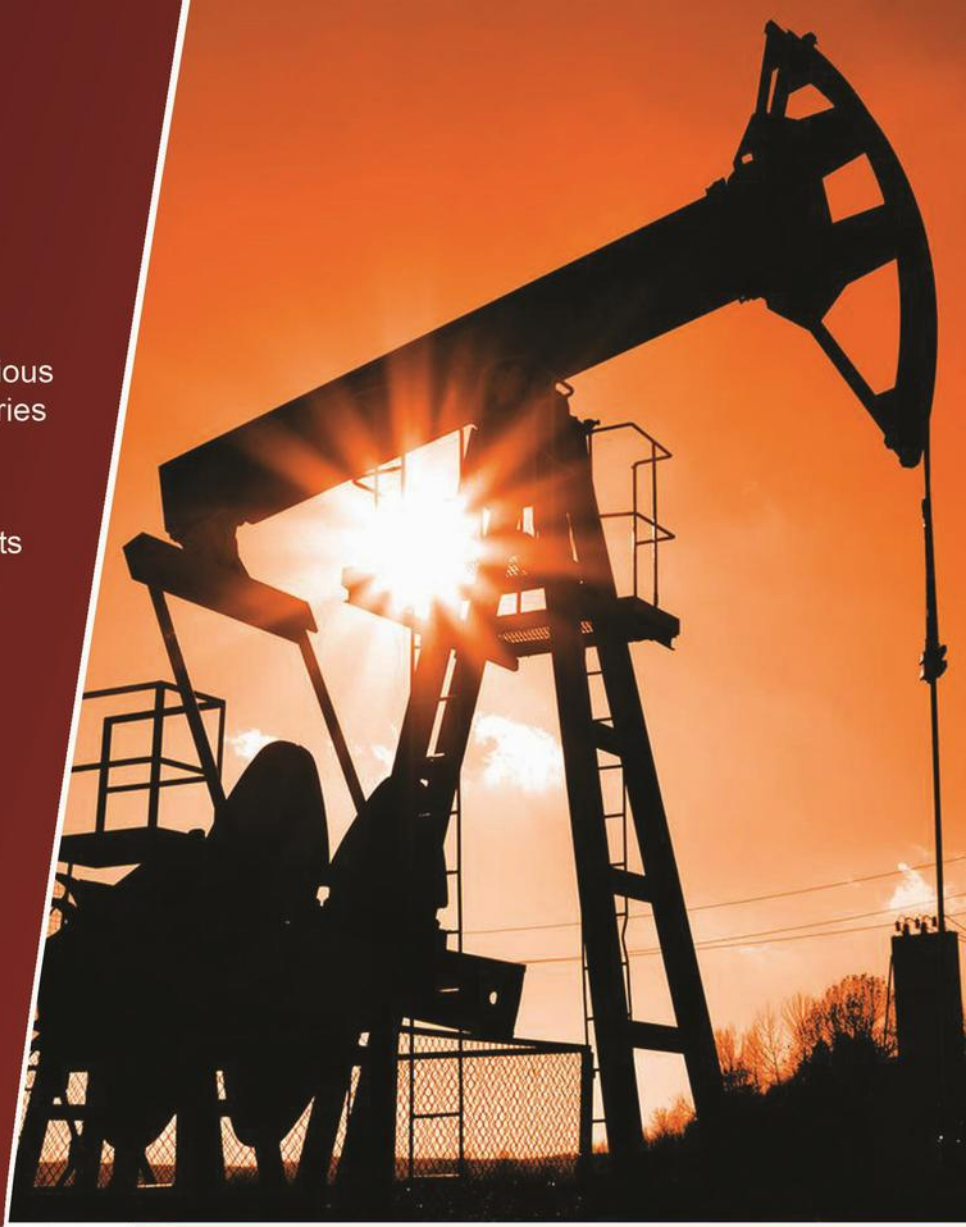


## Areas of Activity

BBS Co. manufactures various equipment for oil & gas laboratories and related industries.

For oil & gas industry the products cover the below laboratories:

- Core Preparation
- Enhanced Oil Recovery (EOR)
- Special Core Analysis Lab (SCAL)
- Routine Core Analysis Lab (RCAL)
- PVT & Phase Behavior
- Drilling



BBS Co. has an invaluable expertise in manufacturing different models of Pumps including High-Pressure High-Precision, Single or Double and Micro Pumps.

These pumps have a big usage in the oil & gas laboratories, and are in attention of many customers.

Furthermore, BBS Co. has the capability to produce all accessories for its manufactured products. Hence, we guarantee all of our products, and we are ready to share our knowledge and train customers.

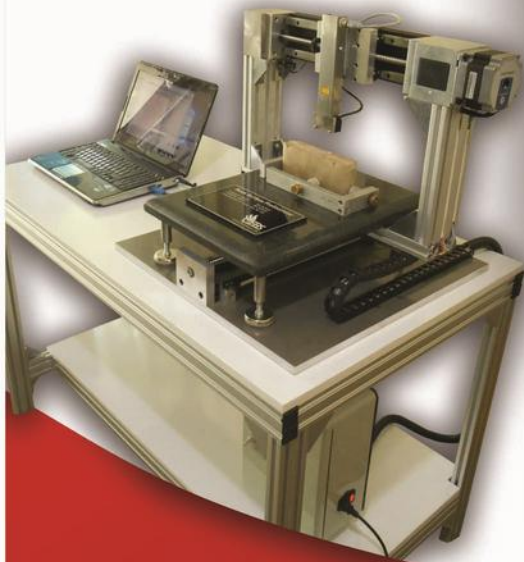
BBS Co. proudly presents its products for Iranian and international customers.



## Enhanced Oil Recovery

- Core Flooding Apparatus (industrial Model)
  - Working pressure and temperature of 10,000 psi and 150°C
  - Flow rate range of 0.001 to 100 cc/min
- Core Flooding Apparatus (Educational Model)
  - Working pressure and temperature of 5,000 psi and 100°C
  - Flow rate range of 0.01 to 30 cc/min
- Acidizing Core Flooding Apparatus
  - Suitable for stimulation studies (acid injection)
  - Working pressure and temperature of 10,000 psi and 120°C
- Rising Bubble Apparatus
  - Determination of the Minimum Miscibility Pressure (MMP)
  - Observation of shape and motion of gas bubbles
- Interfacial Tension Meter
  - IFT standard measurement of 0.1 to 72 mN/m
  - Interchangeable needle tips for a wide range measurement
- Slim Tube Apparatus
  - Determination of the Minimum Miscibility Pressure (MMP)
- Combustion Tube Apparatus
- Sand-Pack System

**Rock Surface Profilometer**



**2-Phase Unsteady State  
Relative Permeability  
Apparatus**



## Special Core Analysis

- 2-Phase Unsteady State Relative Permeability Apparatus
  - Working pressure and temperature of 10,000 psi and 150°C
  - Flow rate range of 0.001 to 100 cc/min
- 3-Phase Relative permeability Apparatus
- Rock Surface Profilometer
  - X, Y axes accuracy of 12.5 micrometer
  - Z axis accuracy of 50 micrometer
- Laboratory Centrifuges
  - Rotary speed up to 20,000 ppm
  - Digital speed and temperature displays
  - High safety feature
- Capillary Pressure and Resistivity System (CAPRI)
  - Injection rate of 0.0001 to 2 cc/min
  - Capillary pressure range of -10 to +10 bar
  - Measurement of formation resistivity factor, cementation component, resistivity index, tortuosity factor, saturation exponent, brine resistivity
- Mercury Injection Capillary Pressure (MICP) Apparatus
  - Working pressure up to 60,000 psi
  - Calculation of pore size distribution & determination of capillary pressure vs. saturation

**Steady-State Gas Permeameter  
(Industrial Model)**



**Routine Core Analysis**

- Steady-State Gas Permeameter (Industrial Model)
  - Permeability ranges of 0.01 mD – 10 D
  - Gas flow of 0 – 50 or 0 – 500 cc/min
  - Pressure transducer accuracy of 0.1% F.S.
- Unsteady-State Gas Permeameter
  - Permeability ranges of 1 mD – 1 D
  - Gas flow of 0 – 500 cc/min
  - Pressure transducer accuracy of 0.2 % F.S.

- Porosimeter (Industrial Model)
  - Porosity range up to 60%
  - Pressure sensor accuracy of 0.1% F.S.
- Porosimeter (Educational Model)
  - Porosity range up to 50%
  - Pressure sensor accuracy of 0.5% F.S.

Products

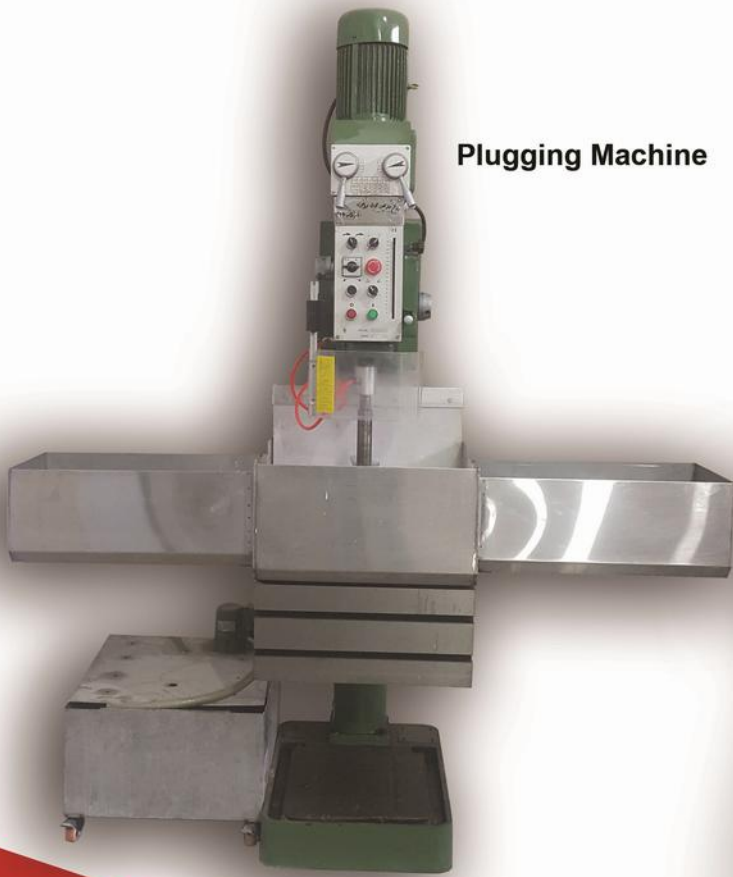
**Unsteady-State Gas  
Permeameter**



**Porosimeter  
(Industrial Model)**



**Plugging Machine**



**Core Cutting Saw**



## Core Preparation

- Core Cutting Saw
  - Maximum cutting depth of 100 mm (4")
  - Saw blade diameter of 350 mm
- Plugging Machine
  - Coring bit internal diameter of 1", 1.5", 2"
  - Maximum coring depth of 13 cm
  - Adjustable drilling speed

## Recombination Cell

- Feature
  - **Max pressure:** 700 bar (10,000 psi)
  - **Max temperature:** 150°C
  - **Cell volume:** 3500 cc
  - **Wetted material:** Hastelloy
  - **Power supply:** 220 VAC, 50/60 Hz

**Recombination Cell**



## Diffusivity Measurement Apparatus (Industrial Model)



## Phase behavior

- Mobile Recombination Cell
  - Working pressure and temperature 12,000 psi and 150°C
- Static Asphaltene Measurement Apparatus
  - Various filter size range
  - Having a high pressure sampler
- Dynamic Asphaltene Measurement Apparatus
  - Fluid injection range of 0.001 to 10 cc/min
  - Having a viscometer for determination of viscosity
- Diffusivity Measurement Apparatus (Industrial model)
  - Working pressure and temperature of 6,000 psi and 120°C
- Diffusivity Measurement Apparatus (Educational Model)
  - Working pressure and temperature of 1,500 psi and 100°C

## Static Asphaltene Measurement Apparatus & Mobile Recombination Cell





## Pumps

- High-Pressure High-Precision Pump
  - Minimum flow rate of 0.001 cc/min
  - Maximum working pressure of 15,000 psi
  - Two different operational modes of constant rate and pressure

**High-Pressure  
High-precision  
Pump (Dual)**



**High-Pressure  
High-precision  
Pump (Single)**



- Micro Pump
  - Injection range of 0.0001 to 10 cc/min
  - Injection rate accuracy of 0.0001 psi
  - Pressure transducer accuracy of 0.2% F.S
  - Two different operational modes of constant rate and pressure

**Micro Pump**



VG meter Apparatus



HPHT Anti Corrosion Viscometer Apparatus



## Viscometer

- **VG meter Apparatus**
  - Max Temperature: 150 °C
  - Max Speed: 600 rpm
  - Measuring range: 1-1000 cp
  - Wetted materials: Stainless steel 316

Products



• The HPHT anti corrosion viscometer is a compact instrument designed to measure the rheological properties of common oil field fluids and acids. It incorporates numerous innovations, which address long awaited needs of the industry, including: user friendliness, improved measurement technology, temperature performance, and ease of service.

- Max. Pressure: 1800 psi
- Max Temperature: 350 °C
- Max Speed: 600 rpm
- Measuring range: 1-1000 cp
- Wetted materials: Hastelloy

## Formation Damage Apparatus



## Formation Damage Apparatus

• The Core Flood System enables to perform (i) liquid permeability measurement, (ii) unsteady state 2-phase relative permeability, (iii) EOR processes such as water flooding, gas flooding and (iv) formation damage tests

- Max. confining pressure: 10,000 psi
- Max. pore pressure: 10,000 psi
- Temperature range: up to 150°C
- Wetted materials: Stainless steel 316L

## Couette Flow Apparatus



## Couette Flow Apparatus

• The flow assurance device is designed to simulate the fluid transfer conditions inside the well as well as transfer lines and measure the amount of solid particles deposition there. This device includes flow guarantee system, injection pump, transfer cylinder, system end pressure controller and cooling system.

- Max. working pressure: 10,000 psi
- Temperature range: up to 150°C
- Max. RPM: 6000 rpm
- Cell volume: 1 lit
- Cell volume Couette Flow: 150 cc
- Max. injection flow rate: 100 cc/min
- Min. injection flow rate: 0.001 cc/min
- Volume pump: 500 cc
- Cooling system volume: 7.2 lit
- Colling system max rate: 6.4 l/min
- Colling system max working pressure: 4 bar
- Wetted materials: Stainless steel 316L

## HPHT-Micro Model- industrial



## HPHT-Micro Model

• Micromodels can be used to study the flow behavior on a pore scale. They are patterns of a porous medium, etched on a silicon or glass surface and hence are representative of the two dimensional structure of the porous medium. Micromodels have been extensively used to study the flow behavior in multiphase flow, oil-foam interaction studies, solution gas drive, contaminant hydrogeology, etc.

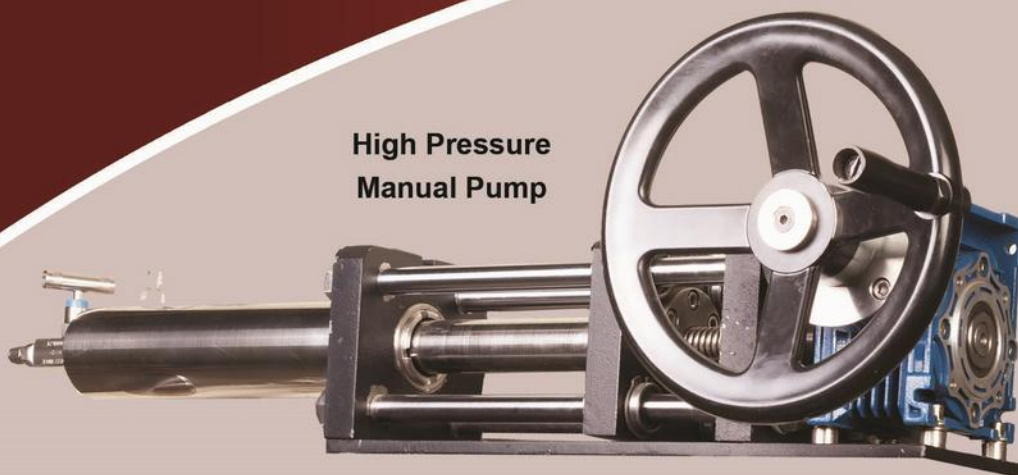
- Max. Pressure: 6000 psi
- Pressure Accuracy: 0.05% FS
- Max Temperature: 100 °C
- • Wetted materials: Stainless steel 316



## Accessories

- Hassler Core Holder
  - Confining pressure of 10,000 psi
  - Core length of 10 to 30 cm
- Triaxial Core Holder
  - Apply the confining pressure in 3 different axis
  - Confining pressure of 10,000 psi
  - Core length of 10 to 30 cm
- Different Models of Transfer Vessel
  - Working pressure up to 15,000 psi
  - Working Temperature up to 150 °C
  - Volume 500-3000 cc
- High Pressure Manual Pump
  - Working pressure up to 10,000 psi
  - Volume up to 150 cc
- Filter Press
  - Working pressure up to 1,500 psi
  - Working temperature up to 250 °C
  - Volume of main cell is 175 cc
  - Filter paper of Whatman
- Back Pressure Regulator (BPR)
  - Pressure range up to 10,000 psi
- Pneumatic Solenoid Valve
  - Pressure range 6,000 to 15,000 psi
  - Ambient Temperature
- Data Logger
  - Can record data over time such as pressure and temperature
  - Number of thermocouple: 2
  - Number of RTD: 2
  - Number of pressure inputs: 4

Products



**High Pressure  
Manual Pump**



**Filter Press**

**Corrosion Coupon  
Type N80**



## Corrosion Coupon

Accurate monitoring of corrosion rates in any environment is critical when viewed in terms of the maintenance and repair costs associated with corrosion and material failure. Corrosion coupons provide an inexpensive means of on-line monitoring that will allow you to effectively measure the corrosivity within your system. Corrosion coupons are a very simple and effective tool. This tool provides a quantitative estimate of the corrosion rate that is occurring within a particular operating system. By observing the mils-per-year corrosion rate of an exposed coupon, valuable information can be provided regarding the material's life expectancy. Coupons also provide an objective signal of the type of corrosion that may occur in the monitored system. According to the mentioned issues, this tool is necessary for corrosion studies, so BBS company has started to produce this tool with the following specifications

- Type N80
  - Weight: 20.85 g
  - Size: 76\*22\*1.6 mm
  - Roughness: 0.2 - 0.6  $\mu\text{m}$
  - Measuring range: 1-1000 cp



**HPHT Isolation Valve**

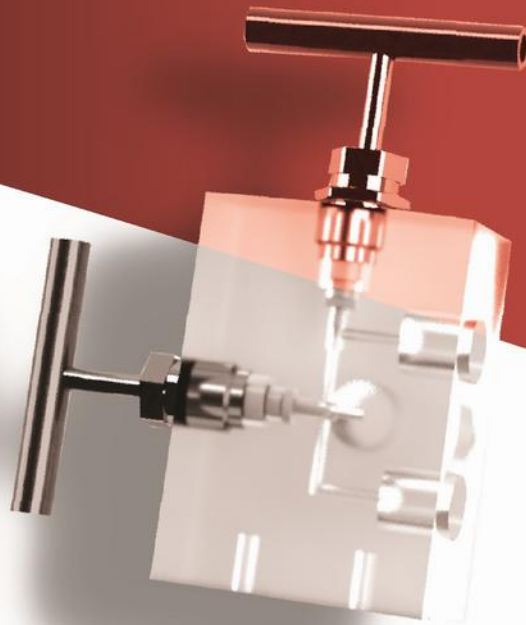


**Specifications of Valves**

- HPHT Manifold Valve
  - Pressure range: up to 15,000 psi
  - Temperature range: up to 150°C
  - Flowing lines: 1/8 and 1/4 in outer diameter
  - Wetted materials: Stainless steel 316L

- HPHT Isolation Valve
  - Pressure range: up to 15,000 psi
  - Temperature range: up to 150°C
  - Flowing lines: 1/8 and 1/4 in outer diameter
  - Wetted materials: Stainless steel 316L

**HPHT Manifold Valve**





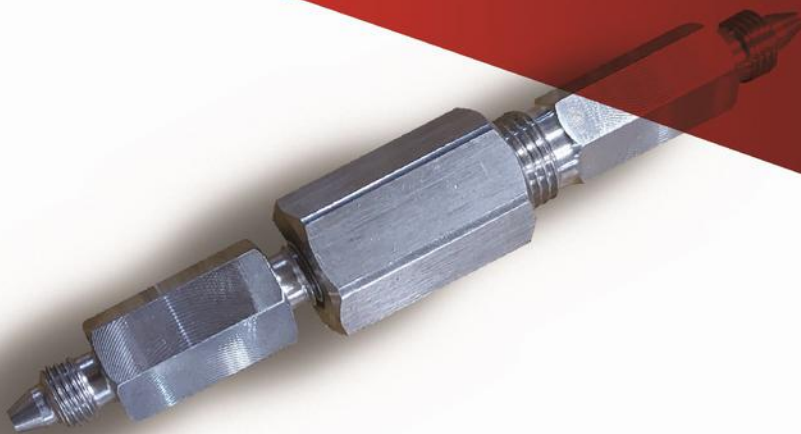
# Adapters



## Adapter Selection Guide

• Adapters are available in both female to male and male to male configurations. Adapter models exist for all connections and in the various pressure ranges to complement our valve and fitting lines.

- Male to Male
  - 3/8" Taper Seal
  - 3/8" Taper Seal to 1/4" NPT
- Male to Female
  - 3/8" Male to 1/8" Tube
  - 1/2" Male NPT to 3/8" Female Taper Seal
  - 1/4" Male NPT to 3/8" Female Taper Seal
- Female to Female
  - 1/4" NPT to 3/8" Taper Seal





## Our Clients:

BBS Co. is capable to equip all oil & gas laboratories. Some of our clients are listed as below:

- Genesis Company in Oman
- Institute of Petroleum Engineering – University of Tehran
- Petroleum Research Center – Petroleum University of Technology
- Sharif University of Technology
- Tehran Science & Research University
- Mapsa Co.
- Jahad Daneshgahi
- Petro Vision Pasargad Co.
- Bushehr University
- Ahvaz Petroleum University of Technology
- Shiraz University





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