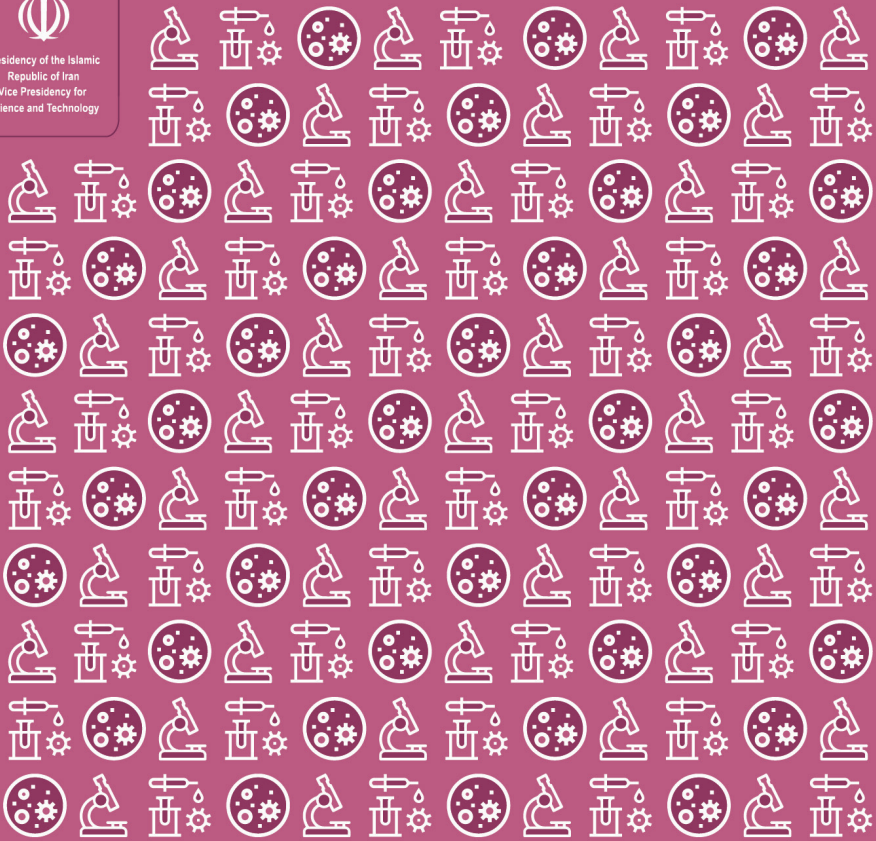




Presidency of the Islamic  
Republic of Iran  
Vice Presidency for  
Science and Technology



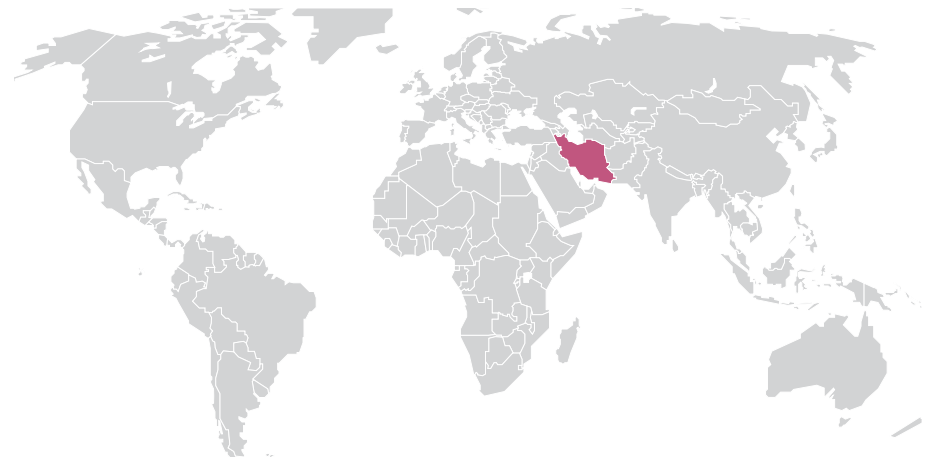
Eighth Volume

# LABORATORY EQUIPMENT

*Knowledge-Based Products and Equipment*

# مجلس المدینة العلمیة

Knowledge-Based Products and Equipment  
**Laboratory Equipment**





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

www.isti.ir



www.cistc.ir



Export Development &  
Technology Transfer Fund

www.etdf.ir



www.ihit-expo.com

## Knowledge-Based Products and Equipment Eighth Volume: **Laboratory Equipment**

**Supervisor:** Export Development and Technology Transfer Fund (ETDF)  
**Email:** info@etdf.ir  
**Website:** www.etdf.ir  
**Tel:** (+98) 21 910 700 80  
**Address:** No 4, Eram Alley, North Shirazi St., Mollasadra St., Vanak, Tehran, Iran,  
P.O BOX 1991734784

# 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: *Maryam mehrabi*

Editorial team: *Fatemeh Mohammadi Siyani*

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

Laboratory Equipment



Knowledge-based products and equipment

# Contents

CHAPTER 0

## Introduction

- The Origin of Industry and Export in The Eyes of Iranians ..... 7
- Industry and Export in Today's Iran ..... 8
- Where the New Technologies Stand in Iran's Industry ..... 9
- The Status of Knowledge-Based Products in Laboratory Equipment ..... 10
- The Division of Knowledge-Based Products in Laboratory Equipment ..... 12

CHAPTER 1

## Advanced Specialized Laboratory Equipment

- Servo-electromechanical relaxation testing devices including accessories ..... 22
- Set of hot creep testing devices including accessories ..... 24
- Hydraulic axial fatigue testing devices without Adaptive Control capability ..... 26
- Set of Charpy and Izod impact testing devices ..... 28
- Universal Hardness Testing Device ..... 30
- Ericsson Testing Device ..... 32
- Rheometer and Mooney Viscosimeter ..... 34
- Polymer Sheet Prototyping Hot Press Devices ..... 36
- Portable Linear Speedometer ..... 38
- Universal Tensile Device Set (Tensile, Pressure, Bending Test) Including Accessories ..... 40
- Hydraulic Rebar Tension Testing Device ..... 42
- Brittleness Temperature Testing Device ..... 44

Softening point and Thermal Forming (HDT VICAT) testing device .....	46
Melt Flow Index (MFI) Device .....	48
Melt Flow Index (MFI) Device .....	50
Super Insulators Thermal Conductivity Coefficient Measuring Device .....	52
Dilatometer (Dil 101 HT, Dil 101 LT).....	54
Differential Scanning Calorimetry (DSC) / Differential Thermal Analysis (DTA) device .....	56
Thermogravimetry Analyzer (TGA).....	58
Simultaneous Thermal Analyzer (STA) .....	60
Surface Profilometer .....	62
Contact Angle and Surface Tension Measurement Device .....	64
Potentiostat-Galvanostat-Electrochemical Impedance Spectroscopy .....	66
Ultrasonic Spray.....	68
Pyrolysis Spray .....	70
Ice and Surface Shear-Stress Measurement Device .....	72
Specific Surface Area measuring (BET&BJH) device .....	74
Specific Surface Area measuring (BET&BJH) and (TPD-TPR).....	76
Pore Size Distribution Determining Device .....	78
Membrane Gas Separation and Permporometry Systems (MGSPS) .....	80
Metal Nanomaterials and Metal Oxide Production (PNC) Device .....	82
Direct Plasma Chemical Vapor Deposition (DC-PECVD) .....	84
Langmuir Blodgett Molecular Deposition .....	86
Cathodic Arc Vacuum Coating System .....	88
Transmission Electron Microscopes (TEM).....	90
Atomic Force Microscope (AFM) with kit.....	92
Scanning Probe Microscope (SPM).....	94
Scanning Tunneling Microscope (STM).....	96
Atomic Force Microscope (AFM) .....	98
Solar Cell Current-Voltage Measuring Device .....	100
Hall Effect and Surface Resistance Measurement System .....	102
Laser Image Measuring Dimensions (LIMOD) .....	104
Automatic Fault Detection in Power Transmission Lines (AFTL)   Vira Label.....	106
4-Terminal Characterization Device (Specially for Transistors).....	108
I-V Characteristic Tracer .....	110
Asher Plasma Cleaning Device .....	112
Vertical Silicone Removal Device (Deep Reactive Ion Etching (DRIE)).....	114
Automatic 7-Stage Wet Etching System.....	116
Advanced Wet Etching Cell.....	118
Pilot Microfluidic Laboratory .....	120
Limited Production Line of Micron Scale Tools .....	122

Alignment Module with 5 Degrees of Freedom .....	124
Two-Way Motorized Mask Aligner Lithography System .....	126
Standing Industrial Lithography System with Motorized Aligner System.....	128
UV Contact Lithography Device.....	130
Pilot Lithography Laboratory .....	132
Complete Lithography Laboratory .....	134
Pilot MEMS Laboratory .....	136
Microfluidic Tools Production Station.....	138
4-Axis Motorized Probe Station with Digital Microscope.....	140
Wind Tunnel Testing Device.....	142
Machine Dynamics and Vibration Laboratory Device Set .....	144
The Set of Materials Strength Laboratory Tests.....	148
Bending and Rebending Testing Device .....	154
Rotary Fatigue Testing Device .....	156
Gasoline or Diesel Engine Testing Device.....	158
Vacuum Testing Device (Sealing) .....	160
Coefficient of Friction Testing Device (Cof) .....	162
Measuring stable or unstable two-phase relative permeability .....	164
Fluid injection device with parallel water flooding capability .....	166
Bone Tissue Engineering Bioreactor .....	168

## Advanced General Laboratory Equipment

High speed centrifuges (up to 15000 rpm and more).....	174
Environmental tests lab for airborne equipment including .....	176
Heat and humidity test chamber device.....	178
-86°C Deep freezers .....	180
-80°C Deep freezers .....	182
-80°C Deep freezers .....	184
High pressure Syringe pump .....	186
Advanced Three Independent Syringe Pump .....	188



Laboratory Equipment

Knowledge-based products and equipment



# Introduction

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

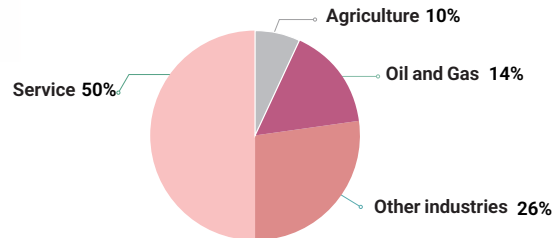
The ancient land of Iran has long been the source of knowledge and industry, and Iranians have played a significant role in the development, evolution and promotion of science and human awareness. Most historians of the world believe that most of the advances in science and human civilization are owed 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**

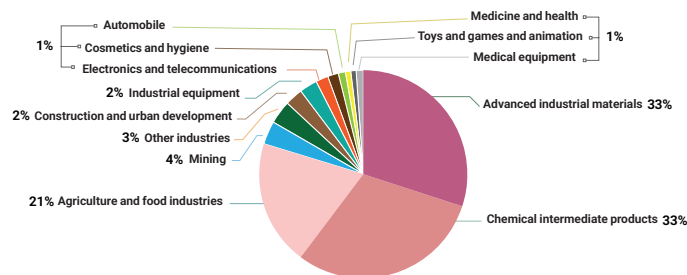


In the meantime, various industries such as pharmaceuticals, medical equipment, construction, communications and telecommunications, energy, mining, chemicals, etc. have a special share of Iran's gross domestic product, and their production, in addition to covering a considerable amount of country's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



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

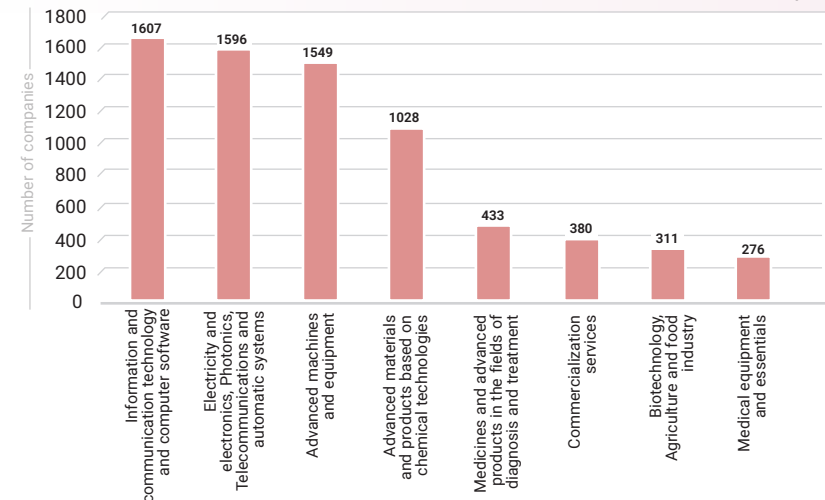
Paying attention to the development of new technologies, commercialization and its influence on manufacturing industries has caused the Islamic Republic of Iran to experience a growing progress in this field in the last decade; An issue that has taken place in Iran in the form of the development of knowledge-based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

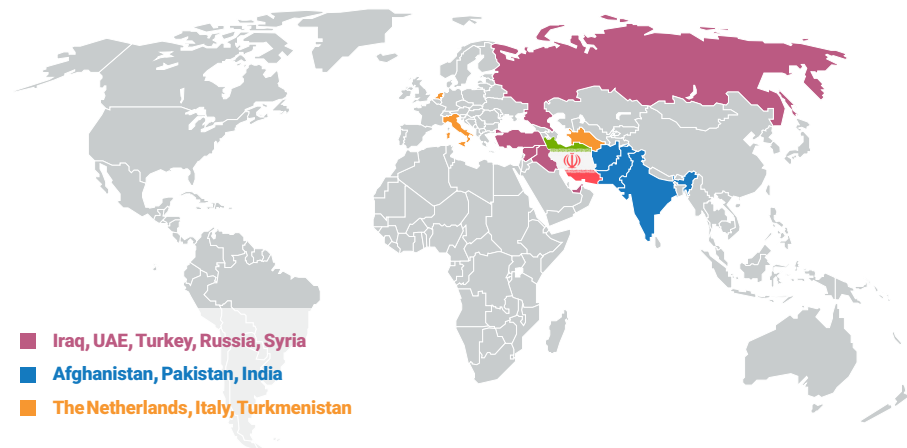
**The Number of Knowledge-Based Companies - Technology Fields**



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

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 Laboratory Equipment**

Today, with the progress of science and technology, we are witnessing significant changes in laboratory equipment and their development. The special importance of this industry is that the laboratory is the origin of research and development as well as innovation in the industry and as a result, the foundation of the technological development of a country. Industrial revolution and technological development are impossible without the activity and work of specialized advanced laboratories in the industry and universities of a country. Therefore, the development and production of laboratory equipment within our own country's borders has a special place in the Islamic Republic of Iran. Some laboratory equipment is common in all laboratories, but some of it is exclusive and is found only in certain laboratories.

Due to the extensive use of laboratory equipment in various industries and its fundamental position, it is not possible to provide a detailed breakdown of the production share of this equipment in the GDP, but it can be stated that all production sectors (including industry, agriculture and food, oil and gas) and active services in Iran are somehow directly related to this industry.

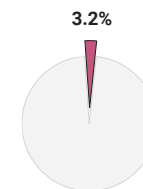
Also, if we consider the laboratory equipment as a part of the production line machinery, it can be said that a part of the annual export of the Islamic Republic of Iran of about

800 million dollars in this area is allocated to the laboratory equipment, which accounts for %1 of Iran's total export.

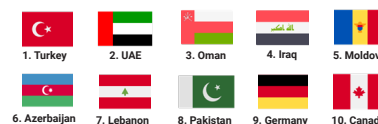
Considering the basic and infrastructural position of this field in the industrial and technological development of Iran, the foundations for the growth of many knowledge-based technologies and products have been provided in it. This thesis can be understood considering the activity of more than 250 Iranian knowledge enterprises and the supply of more than 750 technological products by them.

As already stated, due to the extensive use of laboratory equipment in various industries and its fundamental position, it is not possible to provide an accurate and detailed separation from other industries. Nevertheless, it is believed that at least %1 of Iran's knowledge-based production and employment is directly related to the production of equipment in this area. In general, in the last 5 years, a total of 2 million dollars worth of products of knowledge-based companies that produce laboratory equipment have been exported outside Iran.

**The Percentage of Laboratory Equipment Companies from All the Knowledge-Based Enterprises**

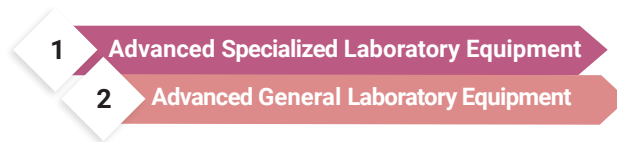


**The Main Export Destinations of Iranian Knowledge-Based Enterprises in the Fields of Laboratory Equipment**



## The Division of Knowledge-Based Products in Laboratory Equipment

As mentioned previously, due to the extensive use of laboratory equipment in various industries and the basic, fundamental and infrastructural position of this area in industrial and technological development, it has provided the foundation for the growth of many knowledge-based technologies and products in this industry. In this book, products have been collected that can generally be divided into the following categories:



The following describes each category and their subcategories in order to give a general understanding of these areas.

### 1 Advanced Specialized Laboratory Equipment

Every sector of industry requires conducting specialized tests based on processes, environmental conditions, manufactured products and important properties. These specialized tests can be related to fluids, biological samples, physical parts and many other cases, and its implementation environment also has its own conditions. In this category, according to the specialized fields of application and test implementation, related equipment has been introduced, which includes the following:

- **First Section | Advanced materials engineering laboratory equipment:**

In this subcategory, all laboratory equipment related to advanced materials engineering including all metals, polymers, ceramics, advanced materials, composites, nanomaterials, etc. is presented. Due to the wide range of applications, this equipment can be used in experiments related to material engineering, physical, mechanical, mining and industrial metallurgy. Among these tests can be mentioned metallurgical tests, mechanical properties, metal products and alloys, chemical analysis and metallography.

- **Second Section | Electronic engineering laboratory equipment:**

Equipment related to specialized experiments in the field of electronics including telecommunications, control, electronics and power are presented in this subcategory and the capabilities of knowledge enterprises are described in them.

- **Third Section | Mechanical engineering laboratory equipment:**

Equipment related to measuring the amount and mechanical properties, which are mostly related to destructive tests, are presented in this subcategory. In addition, the testing equipment for all types of mechanical engines provided by Iranian knowledge enterprises are included in this subcategory.

- **Fourth Section | Petroleum engineering laboratory equipment:**

In the oil and gas and petrochemical laboratory, the components of products such as fuel, crude oil, gas, oil and crude oil are tested. Hence the specialized equipment of this laboratory is more related to the measurement of fluid engineering characteristics and is presented in this subcategory.

- **Fifth Section | Biotechnology and medical laboratory equipment:**

Biotechnology and medical specialized laboratory equipment is used to examine biological samples, and in this subcategory, items that are used in the specialized fields of biotechnology and medicine are presented.

*Start chapter at page 22* >>

## 2

### Advanced General Laboratory Equipment

General laboratory equipment are items and devices that exist in almost all laboratories (including chemistry, physics, material, nano, virology, medicine, pharmaceutical, food) and are widely used in different fields. These pieces of equipment are used for various purposes between laboratories, such as sample processing, implementation of part of a process of an experiment, storage, safety, etc. In this chapter of the book, high-tech items produced by Iranian knowledge-based companies are presented from among general laboratory equipment and include the following items:

- **First Section | Centrifuges:**

A laboratory centrifuge is a piece of equipment that spins samples at high speed using an electric motor. Depending on the size and capacity of the sample, there are different types of centrifuges. Laboratory centrifuges work on the principle of sedimentation and are used to separate materials with higher density by using centrifugal acceleration. In this subcategory, high-speed centrifuges are given as knowledge-based products.

- **Second Section | Chambers for controlling environmental conditions and precise glove boxes:**

The glove box device is an isolated chamber for conducting tests and investigations that require special conditions in terms of test air pressure, gases that make up the test environment, temperature and other environmental characteristics. Usually, all or part of the glove box is designed transparent so that researchers can better monitor their testing process. The glove boxes in this subcategory have the ability to isolate heat and humidity in a special way.

- **Third Section | Laboratory freezers:**

Laboratory freezers are used to preserve sensitive materials and samples and to store non-volatile reactants. In this subcategory, the introduced freezers are of the deep freezer type and have the ability to create temperatures up to minus 80 degrees Celsius.

- **Third Section | Precise peristaltic and syringe pumps:**

The peristaltic pump belongs to the series of injection pumps and can pump various fluids. In this pump, the fluid is trapped inside a tube, and the pump rotor does the task of condensing the tube and putting it under pressure in order to move the fluid inside the tube. The pumps introduced in this subcategory have the ability to create high pressure up to more than 400 bar.

*Start chapter at page 174* >>

# Laboratory Equipment

First Chapter

## Advanced Specialized Laboratory Equipment

- Advanced Materials Engineering Laboratory Equipment
- Electronic Engineering Laboratory Equipment
- Mechanical Engineering Laboratory Equipment
- Petroleum Engineering Laboratory Equipment
- Biotechnology and Medical Laboratory Equipment



Second Chapter

## Advanced General Laboratory Equipment

- Centrifuges
- Chambers for Controlling Environmental Conditions and Precise Glove Boxes
- Laboratory Freezers
- Precise Peristaltic and Syringe Pumps



First Chapter  
Advanced Specialized Laboratory  
Equipment



# 1<sup>st</sup> CHAPTER

FIRST CHAPTER

Second chapter

## Advanced Specialized Laboratory Equipment

Servo-electromechanical relaxation testing devices including accessories		22
Set of hot creep testing devices including accessories		24
Hydraulic axial fatigue testing devices without Adaptive Control capability		26
Set of Charpy and Izod impact testing devices		28
Universal Hardness Testing Device		30
Ericsson Testing Device		32
Rheometer and Mooney Viscosimeter		34
Polymer Sheet Prototyping Hot Press Devices		36
Portable Linear Speedometer		38
Universal Tensile Device Set (Tensile, Pressure, Bending Test) Including Accessories		40
Hydraulic Rebar Tension Testing Device		42
Brittleness Temperature Testing Device		44
Softening point and Thermal Forming (HDT VICAT) testing device		46
Melt Flow Index (MFI) Device		48
Melt Flow Index (MFI) Device		50
Super Insulators Thermal Conductivity Coefficient Measuring Device		52
Dilatometer (Dil 101 HT, Dil 101 LT)		54
Differential Scanning Calorimetry (DSC) / Differential Thermal Analysis (DTA) device		56
Thermogravimetry Analyzer (TGA)		58
Simultaneous Thermal Analyzer (STA)		60
Surface Profilometer		62
Contact Angle and Surface Tension Measurement Device		64
Potentiostat-Galvanostat-Electrochemical Impedance Spectroscopy		66
Ultrasonic Spray		68
Pyrolysis Spray		70
Ice and Surface Shear-Stress Measurement Device		72
Specific Surface Area measuring (BET&BJH) device		74
Specific Surface Area measuring (BET&BJH) and (TPD-TPR)		76
Pore Size Distribution Determining Device		78
Membrane Gas Separation and Permporometry Systems (MGSPS)		80

Metal Nanomaterials and Metal Oxide Production (PNC) Device		82
Direct Plasma Chemical Vapor Deposition (DC-PECVD)		84
Langmuir Blodgett Molecular Deposition		86
Cathodic Arc Vacuum Coating System		88
Transmission Electron Microscopes (TEM)		90
Atomic Force Microscope (AFM) with kit		92
Scanning Probe Microscope (SPM)		94
Scanning Tunneling Microscope (STM)		96
Atomic Force Microscope (AFM)		98
Solar Cell Current-Voltage Measuring Device		100
Hall Effect and Surface Resistance Measurement System		102
Laser Image Measuring Dimensions (LIMOD)		104
Automatic Fault Detection in Power Transmission Lines (AFTL)   Vira Label		106
4-Terminal Characterization Device (Specially for Transistors)		108
I-V Characteristic Tracer		110
Asher Plasma Cleaning Device		112
Vertical Silicone Removal Device (Deep Reactive Ion Etching (DRIE))		114
Automatic 7-Stage Wet Etching System		116
Advanced Wet Etching Cell		118
Pilot Microfluidic Laboratory		120
Limited Production Line of Micron Scale Tools		122
Alignment Module with 5 Degrees of Freedom		124
Two-Way Motorized Mask Aligner Lithography System		126
Standing Industrial Lithography System with Motorized Aligner System		128
UV Contact Lithography Device		130
Pilot Lithography Laboratory		132
Complete Lithography Laboratory		134
Pilot MEMS Laboratory		136
Microfluidic Tools Production Station		138
4-Axis Motorized Probe Station with Digital Microscope		140
Wind Tunnel Testing Device		142
Machine Dynamics and Vibration Laboratory Device Set		144
The Set of Materials Strength Laboratory Tests		148
Bending and Rebending Testing Device		154
Rotary Fatigue Testing Device		156
Gasoline or Diesel Engine Testing Device		158
Vacuum Testing Device (Sealing)		160
Coefficient of Friction Testing Device (Cof)		162
Measuring stable or unstable two-phase relative permeability		164
fluid injection device with parallel water flooding capability		166
Bone Tissue Engineering Bioreactor		168

Advanced Materials Engineering  
Laboratory Equipment

Electronic Engineering  
Laboratory Equipment

Mechanical Engineering  
Laboratory Equipment

Petroleum Engineering  
Laboratory Equipment

Biotechnology and Medical  
Laboratory Equipment





## ➤ Servo-Electromechanical Relaxation Testing Devices

Including all types of Jaws and Fixtures, Dynamometers, Thermal Chambers and Extensometers

◆ Santam Materials Testing Equipment Co.

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



### Product Introduction:

The drop in permanently loaded tensile force on the part that occurs as a result of controlling and keeping it stable is called relaxation. Servo-electromechanical relaxation testing devices record the amount of length change over a long period of time; These types of devices act like the creep device - in which force is the control factor - and displacement is the control factor and measures and records the amount of force loss. The relaxation test device is designed to check the force or stress drop in metals under fully controlled environmental conditions. Basically, this test is performed on PC Wire and PC Strand metals. The above device is provided with Servo Electro-Mechanical mechanism and dead weight in different capacities. In the relaxation test, a specified stress that is less than the final limit (usually 70 or 80% of the final limit) is applied to the sample, and then the control is performed on the change in the length of the sample. In all the process the force loss graph is drawn with respect to time. Release tests are very time-consuming; For this reason, these devices must be very accurate and sensitive, and constant stability and control are among the prominent features of this type of devices. This device is designed for long-term tests according to its specialized mechanism and software. In this way, the maximum amount of strain is controlled by the extensometer and a detailed report of the power loss is recorded over time.

#### Main Export Destinations:

Germany, Italy, Russia, Oman, Lebanon

#### Export History:

Up to 500,000 \$

#### International Standards or Permissions:

ASTM A416, ASTM E328, ASTM A421

#### Founded:

1992

### Application:

- \* Performing the relaxation test for PC WIRE in ambient conditions with a temperature of  $2 \pm 20$  °C
- \* Testing to select materials with higher performance under permanent strain conditions such as coiling
- \* Prestressed wires PC Wire & PC Strand
- \* Determination and evaluation of relaxation test on different metals
- \* Assist in more accurate design or calculations according to simulated working conditions
- \* Research and development (R&D) in the field of high strength steels
- \* Quality control (QC) and production

*This product is final B2B equipment.*

### Technical Specifications:

Model	SRT-100B	SRT-400B
Capacity	10 tons	40 tons
Operation Type	Fully automatic force application by special software	
Test speed range	(0.0001-100) mm/min AC Servo motor and driver	
Force measurement	Low Profile model load cell	
Measurement of location change	Digital magnetic linear encoder extensometer	
Measurement accuracy	F.S% 0.1 degrees of resolution 1 μm	
Stroke-test	150 mm	
Dimensions (width × depth × height)	100 × 70 × 220 cm	116 × 100 × 300 cm
Device weight	750 kg	1550 kg
Type of jaws	Manual WG with various wedges	
Electricity	220 V, 10 A	
power	2 kW	3 kW

### Advantages:

- \* Fully computerized control and special software under the operating system, Windows XP, 7 to perform the relaxation test with the ability to draw the graph of power loss with respect to time (Relaxation)
- \* Controlling the strain applied on the sample according to the standard and automatically
- \* Equipped with AC Servo driver motor for precise movement control (Close Loop control)
- \* High repeatability
- \* Easy of jaw replacement
- \* Having a rigid frame



### ➤ Set of Hot Creep Testing Devices Including Accessories

Including all Kinds of Jaws and Fixtures, Dynamometers and Extensometers

◆ Santam Materials Testing Equipment Co.

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



#### Product Introduction:

Checking the slow and continuous shape change of the sample at high temperatures is called creep test. In other words, creep test is tensile test done at constant temperature and stress. In high temperature applications, the creep ratio becomes very important and it can be defined as a continuous and slow flow of plasticity under constant load or stress. The results of this test are very important in designing the components of a machine that are at high temperature. In general, creep depends on the rate of shape change that continues at operating temperature and under stresses lower than the yield stress. Creep occurs at any temperature, but the importance of creep depends on the nature of the material and the amount of permissible deformation of the part. In this type of test, the applied stress is lower than the yield limit and the temperature at which creep occurs depends on the type of material and the melting point of the alloy. The creep test is performed in two ways: constant stress or constant force. Constant stress testing requires modern devices that can change the force at the same time as the cross-sectional area decreases so that the stress remains constant.

#### Main Export Destinations:

Germany, Italy, Russia, Oman, Lebanon

#### Export History:

Up to 500,000 \$

#### Founded:

1992

#### Application:

- \* Long-lasting creep test at high temperature
- \* Stress rupture test for superalloys (nickel base, iron base, cobalt base) steel and other metals stress rupture test

*This product is final B2B equipment.*

#### Technical Specifications:

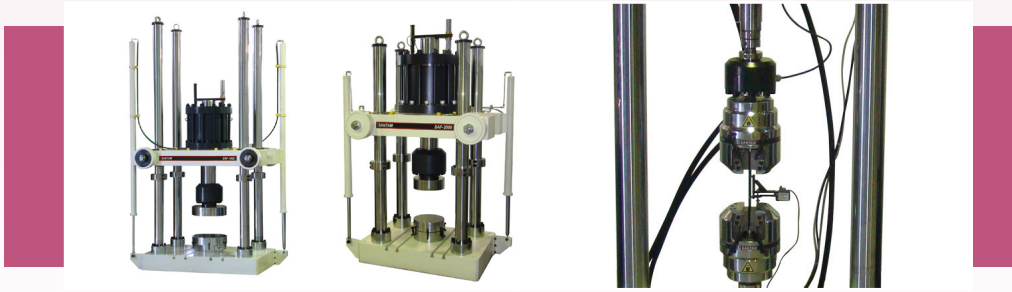
Universal creep test machine with a capacity of 10 tons (1000 degrees)	
<b>Performance type</b>	Servoelectrically with Ball Screw made in Germany (two columns) and AC servo motor
<b>Furnace</b>	It has three thermal zones including heater, sensor and digital temperature controller with PID control for each furnace zone
<b>Attachments</b>	<ul style="list-style-type: none"> <li>* Types of jaws and fixtures</li> <li>* Power meters</li> <li>* Extensometers</li> </ul>
Creep test machine with a capacity of 3 tons (1000 and 1500 degrees)	
<b>Performance type</b>	As a dead load (Dead Weight) and with a constant force control method
<b>Furnace</b>	It has three thermal zones including heater, sensor and digital temperature controller with PID control for each furnace zone
<b>Attachments</b>	<ul style="list-style-type: none"> <li>* Types of jaws and fixtures</li> <li>* Power meters</li> <li>* Extensometers</li> </ul>

#### Advantages:

- \* Digital displays of displacement and time independently and separately from the computer
- \* Carrying out the test even without a computer
- \* Equipped with Self Align interface with the ability to install various adapters and jaws
- \* Ability to install different types of load cells and jaws
- \* Equipped with necessary tools and attachments to perform power calibration

#### International Standards or Permissions:

- \* ASTM E139
- \* EN 1000
- \* ISO 7500



➤ **Hydraulic Axial Fatigue Testing Devices without Adaptive Control Capability** | Including Extensometers, Thermal and Cooling Chambers, Load Cells, Jaws, Fixtures

◆ **Santam Materials Testing Equipment Co.**

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



**Product Introduction:**

Axial tension and axial pressure (fatigue) devices are called Axial Fatigue Machine in the world, which can be provided in capacities from 1 to 300 tons. The design and manufacture of these devices in the world is very complicated and requires a very high level of experience and technology. The most widespread application of this device is in obtaining the useful life of parts in the industry, especially in the automotive and aerospace industries. The function and mechanism of this type of device is servo-hydraulic (using Servo Hydraulic Valve) and has special electronics and software compared to static tension devices. The frequency response and sampling and control system in this device are very high and it controls several movement cycles of the device every second.

SAF series devices are equipped with powerful control software that can define different cycles based on force-control or displacement-control. In addition, these cycles can be with sinusoidal, square, sawtooth, triangular, combined or random waveforms, which according to the software capabilities, crack resistance, crack creation, crack growth, fatigue tests and performance tests can be performed on parts. and reviewed various products.

**Main Export Destinations:**

Germany, Italy, Russia, Oman, Lebanon

**Export History:**

Up to 500,000 \$

**Founded:**

1992

**Application:**

- ※ Performing dynamic hardness tests and performance tests
- ※ Tensile, compressive and control tests
- ※ Simulating movement mechanisms in parts
- ※ Performing fatigue tests on various materials with a large number of wheels
- ※ Testing steel, composite, non-ferrous, concrete, asphalt, spring, shock absorber, airplane and helicopter parts, cars, etc.

*This product is final B2B equipment.*

**Technical Specifications:**

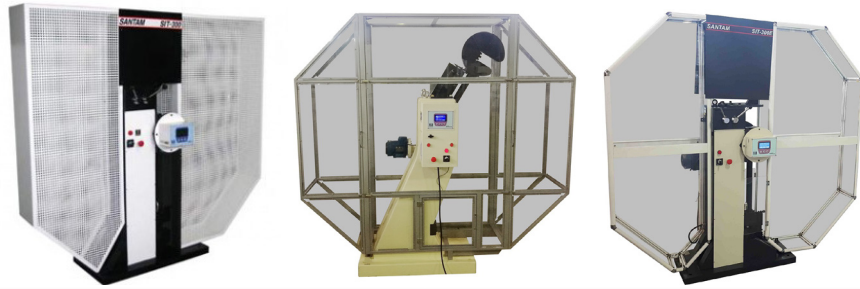
<b>Force frame</b>	Equipped with a two-way power application jack with an equal pressure application surface
<b>Load cell</b>	Diaphragm tension and pressure performance (dynamic)
<b>Displacement capacity</b>	As the total displacement of Actuator
<b>Location change measurement resolution degree</b>	1 micron
<b>Strain accuracy</b>	0.5% of the read value
<b>Ambient humidity</b>	10 to 90% without condensation
<b>Ambient temperature</b>	10 to 30 °C

**Advantages:**

- ※ Fully computerized control
- ※ Equipped with software with special features

**International Standards or Permissions:**

- ※ ASTM E1942
- ※ ISO 14242



➤ **Set of Charpy and Izod Impact Testing Devices**  
with a Capacity of more than 300 Joules, Including Accessories

◆ Santam Materials Testing Equipment Co.

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



**Product Introduction:**

SIT-300E and SIT-450 pendulum impact test devices are Charpy model and are basically used to determine the impact resistance of metals and follow the relevant standards. These devices have a very high safety and safety factor, and in addition, their results are accurate and repeatable. Some of the features of these devices include: being equipped with an electric lift and brake, device protection, digital display, pendulum and accurate hammer, and the ability of self-calibration and other settings.

These devices have a digital LCD display to provide a report and a manual lever to release the pendulum. Working with these devices is very simple and the user can simply perform the test and read the impact energy in Joules on the screen. The pendulum is designed based on the minimum distance between the center of impact of the pendulum and the line of impact. This dynamic feature eliminates all lateral forces in the bearings during the impact and all the energy of the pendulum is transferred to the sample.

**Main Export Destinations:**

Germany, Italy, Russia, Oman, Lebanon

**Export History:**

Up to 500,000 \$

**Founded:**

1992

**Application:**

- \* Investigating the failure of metals caused by momentary loads under ambient temperature conditions and specific environmental conditions
- \* Qualitative analysis of raw materials and manufactured parts and conducted researchs, to control research

*This product is final B2B equipment.*

**Technical Specifications:**

Model	SIT-300 E	SIT-450
Capacity	300 J	450 J
Test method	Charpy	
Release angle	150 degrees	
Display	Digial	
Lift/brake	Present	
Electricity consumption	Three-phase, 380 v, 5 A	
Dimensions	215 × 82 × 220 cm	224 × 90 × 214 cm
Weight	900 kg	1250 kg

**Advantages:**

- \* Lower price than similar products
- \* Very high efficiency
- \* Ease of use
- \* High repeatability and reliability
- \* Equipped with protection

**International Standards or Permissions:**

- \* EN 10045
- \* ASTM E23
- \* ISO 148
- \* DIN 50115



## ➤ Universal Hardness Testing Device

◆ Santam Materials Testing Equipment Co.

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



### Product Introduction:

Hardness test, which is done in different ways, is considered as a part of non-destructive tests. The hardness test is performed as an indentation and this test model is often performed by impacting a sample that is placed on a rigid support. A mandrel with a fixed and specific shape presses on the sample under static load. Depending on the type of test, the hardness is expressed with a number that is inversely proportional to the depth of the effect caused by the specific load and mandrel; In other words, it is proportional to the average load on the effect surface. The usual methods of Rockwell, Brinell, and Vickers hardness test.

- \* Hardness measurement by Brinell method (HB): In this method, a spherical shot (pellet) with a standard diameter is pressed on the surface of the sample and finally the hardness is determined by measuring the average diameter of the effect under a microscope.
- \* Hardness measurement by Vickers method (HV): In this method, an object in the form of a square-base pyramid, where the angle between the opposite faces of the pyramid is 136 degrees, is used, and finally, the average diameter of the effect is measured under a microscope and the hardness is determined.
- \* Hardness measurement by Rockwell method (HR): It is used to measure the hardness of relatively hard materials and there are fifteen types. For example, shot (pellet) Rockwell applies force with the help of shots, and diamond Rockwell applies force on the surface of the sample with the help of a diamond. Finally, the hardness value is shown from the depth of penetration.

**Founded:**

1992

### Application:

Measuring the hardness of metals by Rockwell, superficial Rockwell (direct), Vickers and Brinell (indirect) methods

*This product is final B2B equipment.*

### Technical Specifications:

<b>Code</b>	SUH-200
<b>Test Course</b>	0~300 mm
<b>The undertaking depth</b>	Max 200 mm
<b>Force application mechanism</b>	Servoelectrical with the help of load cell
<b>Hardness measurement accuracy</b>	±1 HRC
<b>Hardness measurement resolution degree (Rockwell)</b>	0.02 HRC
<b>Displacement resolution degree</b>	0.05 μm Extension resolution
<b>Force accuracy</b>	Better than 0.5% applied load
<b>User interface</b>	By (HMI) Touch Screen
<b>Output port</b>	RS-232 to send data to the computer and USB to save data
<b>Electricity consumption</b>	Single-phase electricity 220V and 3A
<b>Device dimension</b>	60x26x92 cm
<b>Weight</b>	110 kg

### Advantages:

- \* Long Course
- \* High applied force
- \* Proper undertaking depth
- \* High measurement accuracy
- \* An operator with the latest technology

### Main Export Destinations:

Germany, Italy, Russia, Oman, Lebanon

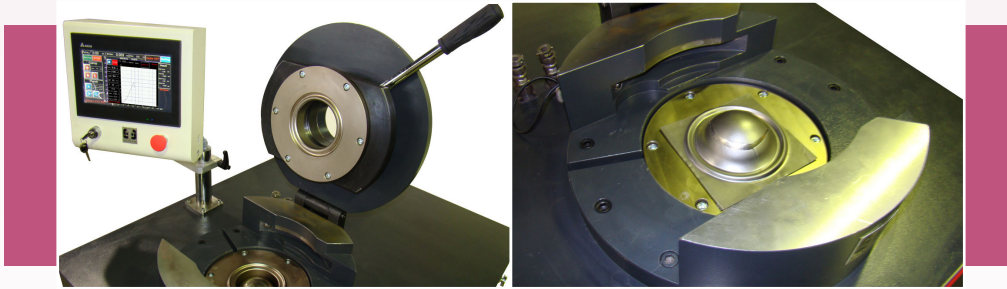
### Export History:

Up to 500,000 \$

### International Standards or Permissions:

- \* ASTM E92
- \* ASTM E10
- \* ASTM E18

*This product is final B2B equipment.*



## ➤ Ericsson Testing Device

◆ Santam Materials Testing Equipment Co.

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



### Product Introduction:

The universal sheet device (Ericsson) is designed to check different sheets. This device includes molds and standard mandrels, which with a very accurate hydraulic mechanism, the amount of force between the molds and the movement speed of the mandrel can be presented in a completely controlled and definable way. With the help of this device, the behavior of biaxial tension on the sheets can be studied and the Limiting dome height (LDH) value is measured by the corresponding sensor. This method is performed with a spherical mandrel. This machine also has the ability to perform deep drawing of sheet metal using the Swift method with a completely flat mandrel. The mechanism of the device consists of two independent hydraulic jacks (for clamping and mandrel) and the function of the device is servo-hydraulic (motor and servo driver) with feedback from changing the position and force to stabilize the speed. Applying its force is performed in a close loop manner and the clamping force of the mold is performed automatically with an independent definition. This device has the ability to stop the test automatically (adjustable) after a crack occurs in the sheet.

### Application:

- \* Deep drawing test in the behavior of metals by the Swift method (Cupping test) to study the depth of cupping and also the phenomenon of earring.
- \* Biaxial tensile test or Erickson's expansion test to determine the limiting dome height (LDH) and draw Forming Limit Diagrams (FLD)
- \* Conducting Hot Forming test on different sheets
- \* Helping to design or more accurate calculations according to simulated work conditions
- \* Controlling the raw materials before production
- \* Research and development in the field of metal sheets

**Founded:**

1992

### Technical Specifications:

<b>Model</b>	STE-200
<b>User interface</b>	By Touch Screen (HMI).
<b>Control system</b>	PLC type with the ability to adjust the parameters of the test method, automatic adjustment of the loading rate and jaw clamping force, and the remote control of the device via LAN to the computer.
<b>Graph drawing</b>	On the screen and the possibility of sending information to the computer by Flash USB 2
<b>Mandrel mold number</b>	2 types of spherical mandrel
<b>Mold and mandrel model</b>	Two types of molds for cold testing
<b>Degree of power resolution</b>	Resolution 1/40.000 of capacity
<b>Speed control range</b>	0.1-300 mm/min
<b>Accuracy of displacement measurement</b>	Extension resolution 0.001 mm
<b>Jaw clamping</b>	Hydraulic with adjustable clamping force (kN 400)
<b>Hot test</b>	Equipped with PID controller for reading PT100 and related settings in HMI
<b>Consuming Electricity</b>	Three-phase electricity; 380 V, 10 A
<b>Device dimension</b>	110 × 80 × 175 cm
<b>Weight</b>	1200 kg

### Advantages:

- \* Ability to replace all types of molds and mandrels according to different standards
- \* Ability to perform Hot Forming test in case of ordering the relevant mold and mandrel
- \* Stopping the test automatically after a crack occurs
- \* Easy to use and easy to transport the device
- \* Reproducibility of results
- \* Lower price than similar products
- \* Very high efficiency

### Main Export Destinations:

Germany, Italy, Russia, Oman, Lebanon

### International Standards or Permissions:

- \* EN DIN ISO 20482
- \* DIN EN 1669

### Export History:

Up to 500,000 \$



**Application:**

- \* Investigating the rheological properties of rubbers and elastomers
- \* The effect of temperature and time on the viscosity of rubber materials
- \* Obtaining specific points and graphical information
- \* Suitable for quality control as well as research and development to combine rubber and elastomeric compounds with calibration attachments.

➤ **Rheometer and Mooney Viscosimeter**

◆ Santam Materials Testing Equipment Co.

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



**Product Introduction:**

Vulcanization of tires and elastomers is done to determine properties such as Mooney Viscosity, Mooney Scorch and Stress Relaxation using SMV-200 series devices. It is very easy to work with this device and the results are obtained with high accuracy, while all the test steps are done automatically. The user is responsible for placing the sample inside the device, and after that, with just one click, the test will proceed to the end. When the test is finished, the device door is automatically opened and the user can easily remove the cured mixture from the device.

It should be noted that according to the type of test, two types of standard rotors (with different diameters) can be selected and installed on the device. Thus, for very viscous samples, where there is a possibility of slippage through the molds and the value of the Mooney Unit may exceed the torque capacity of the device, the small standard rotor is used.

**Main Export Destinations:**

Germany, Italy, Russia, Oman, Lebanon

**Export History:**

Up to 500,000 \$

**Founded:**

1992

*This product is final B2B equipment.*

**Technical Specifications:**

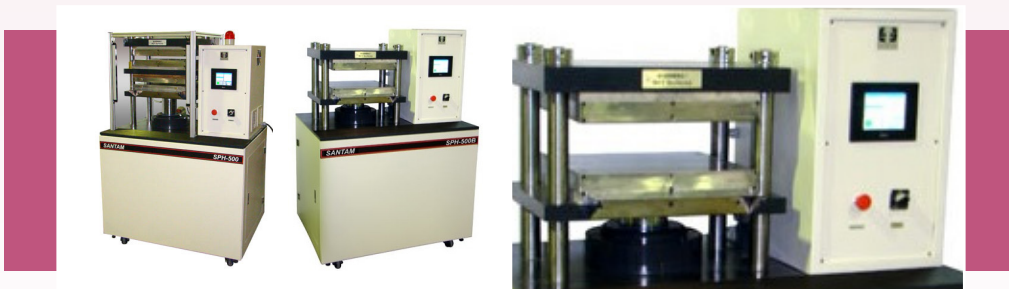
<b>Torque measurement range</b>	0-100 Mooney units
<b>Temperature measurement</b>	In the range of 25-200 °C by heat-resistant platinum sensors
<b>Rotor rotation speed</b>	2 ± 0.02 rpm
<b>Mold closing system</b>	Pneumatic
<b>Vertical force of molds</b>	11.5 KN
<b>Disc clamping</b>	Self-locking with height adjustment
<b>Disc ejection</b>	Manual
<b>Air pressure</b>	6-10 bars
<b>Weight</b>	110 kg
<b>Moisture</b>	10 to 90% non-condensing
<b>Electricity consumption</b>	220 v, 10 A, single-phase, 50 hz
<b>Device dimensions</b>	105 × 69 × 55 cm

**Advantages:**

- \* Lower price than similar products
- \* Very high efficiency

**International Standards or Permissions:**

- \* ASTM D1646
- \* ISO 289:2005
- \* DIN 53525



**Application:**

- \* Production of rubber sheets according to the standard with specified temperature, strength and thickness conditions to perform various destructive and non-destructive tests.
- \* Helps design with more accurate calculations according to simulated working conditions
- \* Research and development in the field of rubber materials
- \* Quality control and production

➤ **Polymer Sheet Prototyping Hot Press Devices**

◆ Santam Materials Testing Equipment Co.

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



**Product Introduction:**

The 50 ton press, which is a hot press with a thermal zone, is a professional and suitable machine for making rubber sheets. The machine is equipped with large plates equipped with special heaters between the plates to bring the temperature of the mold to the required operating temperature with the least energy. Inside it is a hydraulic jack with an electronic pressure gauge to move the bottom plate. In this process, the power is transferred to the plates by a spherical joint (in the form of self-alignment) and the necessary force is uniformly distributed to the press. Finally, a completely uniform sheet with uniform thickness is produced.

The method of working with this device is very simple and the control and definition of the test is done by a HMI touch screen that commands a PLC. Mold temperature, press force, preload time, number of ventilations and baking time, all can be programmed by definition on the touch screen. After determining the control parameters, the compound is poured on the corresponding mold and after pressing the start key, all the baking steps are done automatically. After the cooking time is over, the machine gives an alarm and the cooking process is stopped and the press is opened.

**Founded:**  
1992

*This product is final B2B equipment.*

**Technical Specifications:**

Model	SPH-500	SPH-500B
<b>Mechanism</b>	Full automatic hydraulic	
<b>Maximum jack stroke</b>	300 mm	200 mm
<b>Dimensions of hot sheets</b>	Self-align 400 × 450 mm	
<b>Control system</b>	PLC & fully digital	
<b>Maximum temperature</b>	300 °C	
<b>Calibration</b>	Temperature and Force	
<b>Protection</b>	Laser sensors through curtain control	
<b>Electricity consumption</b>	Three-phase, 380 v, 10 A	
<b>Device dimensions</b>	175 × 80 × 110 cm	160 × 80 × 110 cm
<b>Weight</b>	1200 kg	

**Advantages:**

- \* Lower price than similar products
- \* Very high efficiency

**Main Export Destinations:**

Germany, Italy, Russia, Oman, Lebanon

**International Standards or Permissions:**

- \* ASTM D412
- \* ASTM- D638

**Export History:**

Up to 500,000 \$





**Application:**

Measurement of linear speed and displacement of tensile devices and similar devices

➤ **Portable Linear Speedometer**

◆ Santam Materials Testing Equipment Co.

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



**Product Introduction:**

In tension and pressure testing devices, as well as similar devices where the displacement and speed of the device are particularly important, these parameters should be validated and calibrated by an accurate and reference measurement tool.

SLS-500 is portable and can be easily and magnetically installed on all kinds of devices for displacement and linear speed calibration.

**Main Export Destinations:**

Germany, Italy, Russia, Oman, Lebanon

**Export History:**

Up to 500,000 \$

**Founded:**

1992

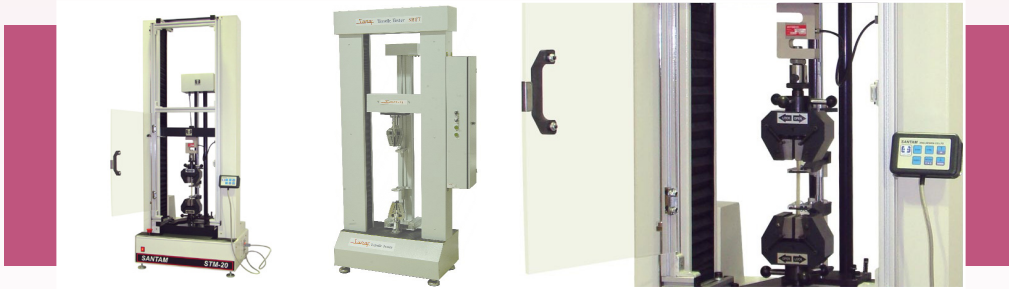
*This product is final B2B equipment.*

**Technical Specifications:**

<b>Model</b>	SLS-500
<b>Displacement measuring course</b>	500 mm
<b>Displacement measuring accuracy</b>	5 microns
<b>Speed measuring range</b>	0.05 to 1500 mm per minute
<b>Display</b>	Portable with LCD screen and corresponding keyboard
<b>Operating temperature</b>	10-38 °C, 10-90% humidity, non-condensing
<b>Electricity consumption</b>	0.5 A, 9 v
<b>Dimensions</b>	68 × 0.75 × 17 cm
<b>Weight</b>	5 kg

**Advantages:**

- \* Lower price than similar products
- \* Very high efficiency
- \* Ability to charge the system for use without city electricity
- \* The box for carrying the device and accessories is completely protected
- \* It has a separate pulse output to check the correctness of time calibration
- \* Installable on most tensile testing devices
- \* The ability to define all types of relevant sensors with different accuracies
- \* Ability to report errors in each test along with average errors, maximum, minimum and standard deviation



## ➤ Universal Tensile Devicesa Set (Tensile, Pressure, Bending Test)

Including Accessories 50, 100 and 250 Kg and 1, 2, 5, 10, 15, 60 and 100 Tons

◆ Sanaf Co.

www.sanaf.com

### Product Introduction:

This device is designed to perform tension, pressure and bending test of different types of materials and for high tonnage, its performance type is mechanical servo using (two-column ball screw) and AC servo motor and driver. zemic load cell with an accuracy of about 0.02% of FS is used to accurately measure force. Also, the displacement measurement accuracy is 0.001 mm. The speed of the device for testing, despite its high tonnage, is in the range of 0.01-200 mm/min. The device has the ability to install different jaws to perform various tests. The size and mechanical structure of the device, the shape, material and dimensions of clamps suitable for different tests (compressive, tensile, bending, stiffness and cyclic resistance, etc.), the axial orientation of the device, the drive specifications and the type and dimensions and shape of the sample and the required test speed are among the effective parameters in the design and construction of this device.

### Main Export Destinations:

Turkey, Azerbaijan, Uzbekistan, Turkmenistan and Oman

### Export History:

Up to 500,000 \$

### Founded:

2002

### Application:

Conducting tension, pressure and bending tests for various types of materials, including metals, wood, plastic, elastomers, ceramics, etc.

*This product is final B2B equipment.*

### Technical Specifications:

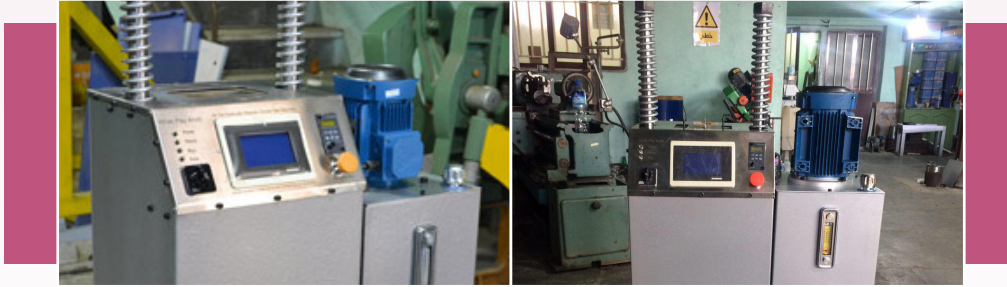
Capacity to apply force	0.1-15 tons (according to the buyer's order)
Sample clamp	In the range of 0-40 mm thickness without changing the jaws
Capacity of different loads	50-150 tons
Different gap range	300 - 1700 mm

### Advantages:

- \* Use of ball screw and load cell force application system with high precision
- \* Ability to install extensometer with high precision
- \* Replaceable load cells, jaws and fixtures
- \* Ease of use and maintenance
- \* Ability to test a wide range of materials
- \* High accuracy and repeatability
- \* Modular design

### International Standards or Permissions:

- \* ISO 6259
- \* ISO 527
- \* ASTM D638



### Application:

Industrial labs

## ➤ Hydraulic Rebar Tension Testing Device

◆ **Khakpey Arvin Co.**

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



### Product Introduction:

Along with the development of the construction industry, the quality control of the buildings has become more serious and important and paid more attention to details. Moreover, considering so many types of building materials today, many quality control tests and experiments on building materials, especially structural materials that play a vital role in building strength, such as concrete and rebar, have been made mandatory according to national building regulations. Each of the tests of these materials characteristics requires a special device that can test the material. One of the significant devices is the rebar tensile test device.

The function of the rebar tensile device is that the 50 cm sample of the tested rebar is fixed by the clamps (jaws) of the device, the device puts the rebar under tensile force. by increasing the tensile force to it; First, the rebar sample is deformed in the elastic range, and after passing through the stress  $F_y$ , it is deformed in the plastic range. Finally, upon reaching the final tensile strain or the ultimate stress  $F_u$ , the sample will break.

**Founded:**

2014

*This product is final B2B equipment.*

### Technical Specifications:

<b>Maximum tensile capacity</b>	50 tons (suitable for testing rebar in size 8-30 mm)
<b>Maximum tensile course</b>	160 mm (the maximum relative increase in length that can be tested in 40%)
<b>Strain measurement accuracy</b>	1 $\mu$ m
<b>Loading rate</b>	3-20mm/min

### Advantages:

- \* Equipped with a -5inch touch screen which is installed on the device with the ability to connect to a computer and laptop
- \* Measuring and displaying  $F_y$ ,  $F_u$  and percent elongation and drawing the stress-strain diagram
- \* Equipped with windows-based software with the ability to output the results in an Excel file
- \* It functions without needing to connect to a computer
- \* No need to change the bites in various test sizes and no need to install an extensometer
- \* Of latest technology and build quality
- \* It has much less weight and dimensions than other tensile testing devices with similar capacities
- \* 1 year full warranty
- \* Lifelong after-sales service



## ► Brittleness Temperature Testing Device

◆ Sanaf Co.

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

**Sanaf**  
Pazarturk Ekonomi

### Product Introduction:

The application of this device is tensile and bending tests on metal and rebar samples up to 40 mm in diameter. Also, this device is designed for all types of metallic and non-metallic materials against tensile, compressive and bending forces, and by adding parts, it can be used for tests of steel cables, rubber belts and chains. The lower part of the two jaws is used to test the compression and bending resistance equipment. From the upper part, standard size jaws for round and flat sections provide tensile strength equipment. Device's jaw clamp is of hydraulic type.

### Main Export Destinations:

Turkey, Azerbaijan, Uzbekistan, Turkmenistan and Oman

### Export History:

Up to 500,000 \$

### Founded:

2002

### Application:

- \* The ability to perform tests for metals, bars and belts, all types of rubber, plastics and composites, industrial parts, etc.
- \* Ability to perform tensile, bending, compression, peeling, tear, relaxation, and creep tests

*This product is final B2B equipment.*

### Technical Specifications:

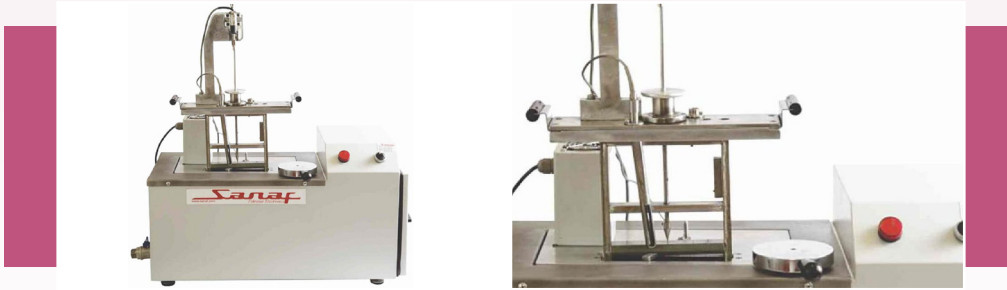
Measurement accuracy	Class 0.5
Device speed	1-200 mm/min
Device control	Fully computerized PC through serial port 232 USB RS without limitation in PC type
Temperature range	-70 to +30 °C
Temperature accuracy	±5 °C

### Advantages:

- \* Has a digital flowmeter inside the speed device
- \* Has sample holding clamps (6 samples)
- \* Special compressor for the cooling system
- \* Ability to display the temperature graph by time
- \* Touch screen

### International Standards or Permissions:

- \* ISO 6964
- \* ASTM D1603
- \* ISIRI 7178-2



## ➤ Softening point and Thermal Forming (HDT VICAT) Testing Device

◆ Sanaf Co.

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

**Sanaf**  
Precision Electronics

### Product Introduction:

With the help of HDT VICAT test, it is possible to determine the temperature at which the polymer sample undergoes a change in shape due to the application of force, or at this temperature, a standard needle goes into the sample under a certain force. The temperatures at which these changes occur are called the HDT (sample shape change temperature) and the VICAT (needle penetration temperature in the sample) temperatures, respectively.

### Main Export Destinations:

Turkey, Azerbaijan, Uzbekistan, Turkmenistan and Oman

### Export History:

Up to 500,000 \$

### Founded:

2002

### Application:

Investigating the permeability of test objects under different temperature conditions in polymeric materials

*This product is final B2B equipment.*

### Technical Specifications:

Temperature accuracy	±1°C
Temperature range	20 to 300 °C
Displacement accuracy	±0.01
Load weight accuracy	1g

### Advantages:

- \* Display the temperature of the heating chamber
- \* Has a cooling system
- \* Ability to save all test information
- \* Display of softening/bending temperature automatically within the software

### International Standards or Permissions:

- \* ISIRI 6982
- \* ISIRI 2414
- \* ISO 306
- \* ASTM D1525
- \* DIN 53460



**Application:**

Measuring the flow rate of molten material in a certain period of time

➤ **Melt Flow Index (MFI) Device**

◆ Sanaf Co.

www.sanaf.com



**Product Introduction:**

The melt flow index (MFI) is a measure of the melt flow ease of a thermoplastic polymer. The melt flow index (MFI) unit is defined as the mass of molten polymer passing through a hole (Die) in grams with a certain diameter, length and pressure in ten minutes at a certain temperature (polyethylene 190 °C and polypropylene 230°C). In order to identify the properties of polymers, various time-consuming and expensive tests are performed in reputable laboratories. But in the industry, due to the need to identify the process properties of polymers more quickly, the MFI (melt flow index) is used.

**Main Export Destinations:**

Turkey, Azerbaijan, Uzbekistan, Turkmenistan and Oman

**Export History:**

Up to 500,000 \$

**Founded:**

2002

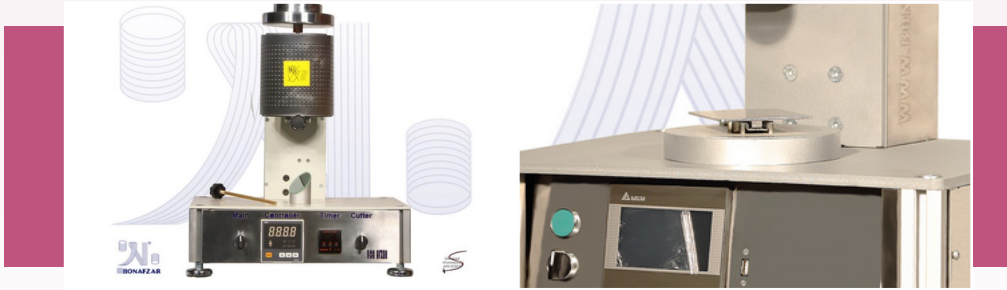
*This product is final B2B equipment.*

**Technical Specifications:**

Test temperature	25-250 ± 0.2 °C
Load weight	325-21000 gr
Cylinder dimensions	* Length: 162 mm * Piston: 9.55 mm
Die-head dimensions	* Diameter: 9.5 mm * Height: 0.0025 ± 8 mm * Hole: 0.005 ± 2.095 mm
Power supply	220 v
Dimensions	350 × 550 × 600
Weight	60 kg

**International Standards or Permissions:**

- \* ISO 1133
- \* ISIRI 6980-1
- \* ISIRI 6980-2
- \* ASTM D1238



## ➤ Melt Flow Index (MFI) Device

◆ Bon Afzar Co.

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



### Product Introduction:

The Melt Flow Index (MFI) test, one of the widely used tests to check the properties of polymers, is used to identify the process properties of polymers more quickly. The melt flow index is actually a measure of the fluidity of the material in the molten state, which is somewhat inversely proportional to the viscosity. Considering that polymers are composed of molecular chains with different lengths, therefore, the molecular weight distribution parameter is important for them and determines the flow properties. Thus, the MFI is a function of the molecular weight of the polymer. The higher the MFI value, the lower the molecular weight and shorter chain length of the polymer. As a result, the viscosity of the material is less and the polymer melt is more fluid and it is processed at a lower temperature.

**Founded:**

1993

### Application:

Determining the viscosity of polymeric materials and the percentage of MFI

*This product is final B2B equipment.*

### Technical Specifications:

Dimensions	400 × 400 × 500 mm
Power	220 V with 400 watt
Cylinder length	13.5 cm
Piston diameter	9.44 mm
Temperature range	0-400 °C
Piston rod length	150 mm

### International Standards or Permissions:

- \* ISIRI 6980 - 1
- \* ISIRI 6980 - 2



## ➤ Super Insulators Thermal Conductivity Coefficient Measuring Device

◆ Radman Sanat Co.

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



### Product Introduction:

The hot wire method is a transient method that operates based on increasing the distance from a linear heat source (which is placed inside the sample). If we assume that this heat source gives heat at a certain distance from the sample with a constant power, the thermal conductivity coefficient is calculated according to the temperature increase of the sample piece in a certain time. In the mathematical modeling of this method, it is considered that the ideal state has the following conditions:

- \* The thickness of the wire is assumed to be very low.
- \* The length of the heat source is assumed to be long.
- \* The sample piece has an initial temperature and has very large dimensions that completely covers the heat source.

### Main Export Destinations:

Turkey, Azerbaijan, Uzbekistan, Turkmenistan and Oman

### Export History:

Up to 500,000 \$

### Founded:

2009

### Application:

Measuring the thermal conductivity of solid materials with a very low thermal conductivity coefficient

*This product is final B2B equipment.*

### Technical Specifications:

Hot wire material	Pure platinum
Thermocouple type	S-type to measure the temperature of the sample
Structure material	Carbon steel with electrostatic powder coating (color)
Multimeter type	Digital
Desired temperature	10 to 30 °C
Humidity	15-80%
Dimensions (mm)	1800 × 1500 × 1000
Weight (Kg)	250





## ➤ Dilatometer (Dil 101 HT, Dil 101 LT)

◆ Dama Pajouh Arvin Co.

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



### Product Introduction:

Material thermal behavior analysis systems are equipment that can be useful in these cases: measuring material dimensional changes at different temperatures and as a result extracting their behavioral characteristics, calculating the amount of expansion and contraction during heating (linear-volumetric), determining the coefficient of thermal expansion, determination of sintering temperature and sintering steps, determination of glass temperature, etc. Thus, these devices require a temperature increase chamber/furnace, a dimension and temperature measurement system, a DAQ section, control software, and data management and storage software. This device is used to measure the dimensional changes of the sample as a function of temperature (the temperature of the sample is increased during a controlled process). This device is offered in two models low-temperature LT (up to 1000 °C) and high-temperature HT (up to 1500 °C). Each type of high temperature and low temperature also has two subtypes 101 and 102, the difference between which is the ability or inability to create a vacuum in the furnace.

**Founded:**

2013

### Application:

The dilatometer is often used in the research and development department to control the quality of solids, liquids, and powders and to determine the following:

- ※ Linear thermal expansion (AL)
- ※ Sintering temperature and sintering steps
- ※ Determination of glass transition temperature (Tg)
- ※ Phase changes
- ※ Optimization of burning processes
- ※ Determination of thermal expansion coefficient
- ※ Volume changes

*This product is final B2B equipment.*

### Technical Specifications:

<b>Furnace</b>	<ul style="list-style-type: none"> <li>※ <b>LT model:</b> RT-1100 °C</li> <li>※ <b>HT model:</b> RT-1500 °C</li> </ul>
<b>Measurement range</b>	5000 μm
<b>Resolution</b>	30 nm/digit
<b>Sample length</b>	0-50 mm
<b>Sample diameter</b>	1-9 mm
<b>Sample holder</b>	Al <sub>2</sub> O <sub>3</sub> or Fused Silica
<b>Atmosphere</b>	Inert gas, oxide



## ➤ Differential Scanning Calorimetry (DSC) Differential Thermal Analysis (DTA) Device

◆ Dama Pajouh Arvin Co.

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



### Product Introduction:

The operational basis of this device is enthalpy. In the Differential Thermal Analysis (DTA) method, the temperature difference between the unknown sample and the control sample is measured while both samples are heated with the same thermal program. In this device, with the help of a thermocouple, the temperature difference of two samples  $\Delta T$  and the temperature of the control sample  $T$  can be determined. The values of  $\Delta T$  and  $T$  are amplified and then sent to the recording part, where the change of  $\Delta T$  is stored in terms of  $T$  and used for analysis. Temperature control is done by an electronic circuit and with the help of another thermocouple placed in the furnace body. This device can also be used for Differential Scanning Calorimetry (DSC) analysis. In this case, unlike DTA, the unknown and control samples are kept at the same temperature, and the difference in energy required to keep the temperature constant, according to the change in temperature, is the obtained output. The control sample is a sample that does not show any physical and chemical changes during heating that cause the sudden absorption or release of heat. It is considered as a thermally neutral sample.

### Application:

※ The ability to create heat in the furnace, Measuring the temperature of the furnace and control it, Measuring the temperature of the sample, collecting and transferring data.

**Advantages:** Customazation

**Founded:**

2013



Laboratory Equipment

Knowledge-based products and equipment



## ➤ Thermogravimetry Analyzer (TGA)

◆ Dama Pajouh Arvin Co.

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



DAMA PAJOUH ARVIN Co.  
Innovative Engineering Solutions

### Product Introduction:

This product is used to measure mass reduction. It can be said that Thermogravimetry Analysis (TGA) is an analysis in which changes in the mass of matter are recorded as a function of temperature or time. This technique can be used as a good method in evaluating the thermal stability of different materials and compounds. In this method, as a result of applying heat to a material, the mass of the material may increase (for example, due to absorption or oxidation) or decrease (for example, due to loss of water).

### Application:

- ✧ Thermal decomposition of plastics
- ✧ Research and development related to ceramic adhesives and thermoelectric materials
- ✧ Evaluation of oxidation and reduction reactions of iron and steel materials
- ✧ Investigating the temperature stability of different materials at high temperatures and under the atmosphere
- ✧ Identification of materials and some compounds from the weighing curves and their derivatives

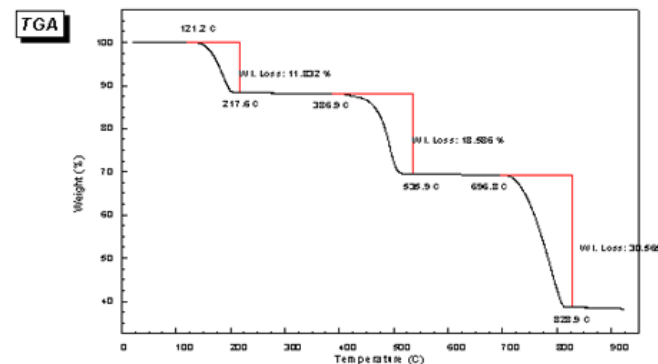
*This product is final B2B equipment.*

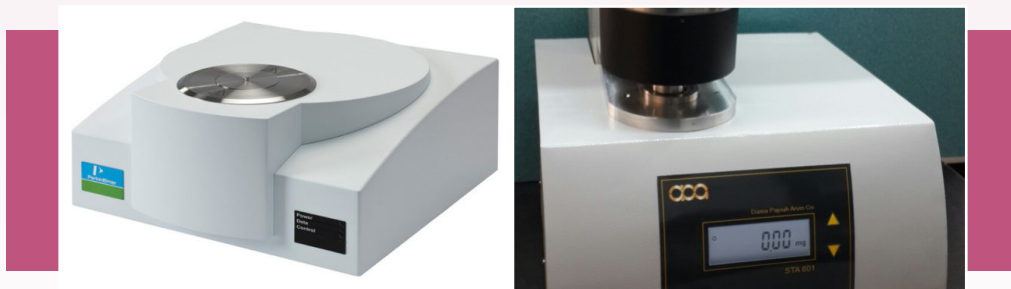
**Founded:**

2013



**DAMA PAJOUH ARVIN Co.**  
Innovative Engineering Solutions





## ➤ Simultaneous Thermal Analyzer (STA)

◆ Dama Pajouh Arvin Co.

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



### Product Introduction:

In TGA analysis, the sample is decomposed by heat or reacts with the surrounding gas environment. In the TGA thermal weighing device, a sensitive electronic scale is placed separately, which measures the changes in the weight of the sample in terms of the change in electric current in a coil. In DTA analysis, the substance under study and an inert control sample must be subjected to the same thermal cycles, which is essentially the same cooling or heating program. Meanwhile, any temperature difference between the test sample and the control sample is recorded and finally the graph of this temperature difference is drawn according to time. The STA analysis device records the TGA and DTA curves at the same time. As a result, this device has two major advantages over separate devices: reducing the analysis time and the same test conditions for both methods of thermal analysis.

**Founded:**

2013

### Application:

- ※ Measurement of parameters such as change in mass, crystal-to-glass transition temperature, chemical decomposition temperature, thermal stability, oxidation stability, enthalpy, specific heat and phase diagrams.
- ※ Thermal analysis of powder samples or very small metallic and non-metallic parts (in the atmosphere of air or inert gases)
- ※ Study of catalytic modes, decomposition reactions and speed of reactions
- ※ Studying the polymerization of organic materials
- ※ Characterization of melting, freezing, evaporation and sublimation reactions
- ※ Study of pyrolysis of coal, wood and petroleum derivatives
- ※ Determining the amount of moisture, volatile substances and ash of different materials

*This product is final B2B equipment.*

### Technical Specifications:

<b>Thermal range</b>	Ambient temperature up to 1500 °C
<b>Measurement range</b>	0-35 gr
<b>Sensitivity</b>	10 Mgr

### Advantages:

- ※ Very high temperature range of STA analysis compared to TGA and DTA analyses
- ※ High temperature change rate up to 1000 K/min
- ※ The ability to create diversity in the type of furnace, sensors and test atmosphere
- ※ Investigation of kinetic functions of temperature changes with high accuracy



### Application:

- ※ Measurement of surface profile in one dimension with 50 nm accuracy
- ※ Measurement of surface roughness
- ※ Measuring the thickness of step layers
- ※ A practical product in the field of solar cell research and thin film laboratories

## ➤ Surface Profilometer

◆ Sharif Solar Co.

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



### Product Introduction:

A profilometer is a surface profile measuring device using a moving tip. In this device, the tip moves with a variable speed and an adjustable distance on the sample's surface, and a capacitive sensor measures the displacement of the tip in the z-direction. The measurement accuracy in the z direction is better than 50 nm. The profile of various samples, including metal, glass, plastic, and coatings, can be measured. In places of the sample where there is a sharp step of the layer, the profilometer can measure the height of the step and declare the thickness of the layer.

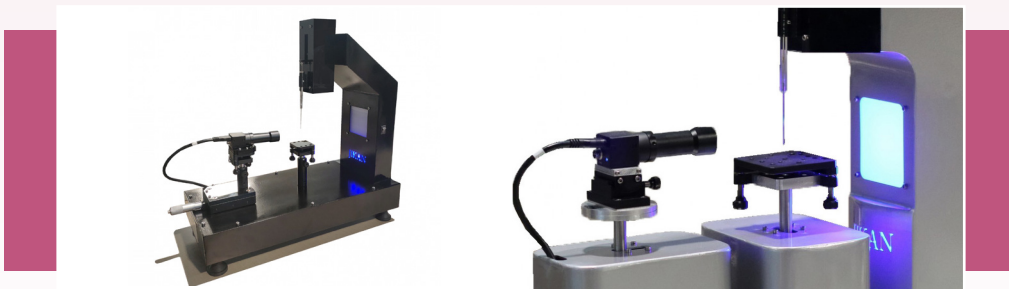
**Founded:**

2014

*This product is final B2B equipment.*

### Technical Specifications:

<b>Model</b>	<ul style="list-style-type: none"> <li>※ PFM-6020</li> <li>※ PFM-6040</li> </ul>
<b>Measurement technique</b>	Contact with Stylus profiling
<b>Profilometric measurement</b>	1D surface profile measurement
<b>Camera view type</b>	<ul style="list-style-type: none"> <li>※ 640 × 480pixel, 500-50X Magnification, Focusable</li> <li>※ digital camera</li> </ul>
<b>Stylus sensor</b>	Capacitive displacement sensor
<b>Stylus approach</b>	Automated stylus approach system
<b>Sensor calibration</b>	Automatic calibration system
<b>Stylus movement</b>	Motorized movement of x and z axis
<b>Maximum wafer size</b>	120 mm
<b>Growth length</b>	3 cm
<b>Data points per scan</b>	Max. 10,000
<b>X-Scan steps</b>	1.3 μ



## ➤ Contact Angle and Surface Tension Measurement Device

◆ Jikan Surface Nano-Engineering Co.

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



### Product Introduction:

The angle formed between the tangent line drawn from the three-phase contact point and the contact line of the liquid and the surface is called the contact angle. This angle provides a measure of surface wettability. In general, there are two types of contact angle: static contact angle and dynamic contact angle. The dynamic contact angle includes forward, backward, hysteresis and rolling contact angles. A contact angle measuring device consists of an illumination and imaging system and is designed to store an image of the droplet profile on a solid surface. In older systems, a microscope was used instead of a camera, and the images were analyzed by the operator. In the new systems, a high-speed camera with a suitable resolution and automatic image analysis software are used. To measure the contact angle, there are many methods, including static and dynamic Sessile Drop methods. By using the contact angle measuring device, in addition to evaluating the wettability level, it is possible to ensure the quality of the surface properties of the coatings.

**Founded:**

2016

### Application:

Measurement of static contact angle, dynamic contact angle, surface tension and surface energy

*This product is final B2B equipment.*

### Technical Specifications:

Measurement accuracy/range	0-180 °C ±1 °C
Imaging system	<ul style="list-style-type: none"> <li>* Progressive CMOS sensor</li> <li>* Global shutter</li> <li>* Optical imaging up to 150 fps</li> </ul>
Lens	Telecentric trap
Telecentricity range	±1mm
Adjusting the angle of the camera head	Manual
Lighting system	<ul style="list-style-type: none"> <li>* LED without heat</li> <li>* <b>Wavelength:</b> 450 nm</li> </ul>
Input	USB 3.0
Power supply	110/220 V, 50 Watt, AC

### Advantages:

- \* Has the exclusive software of Jikan company for measuring the contact angle and surface tension, with two years of software support and free updates.
- \* Automatic injection system, with software control
- \* Modular injection system with replaceable syringe
- \* Advanced imaging system using high speed camera and telecentric lens
- \* Ability to add temperature, pressure and humidity control modules
- \* Compatible with surface durability testing device with temperature cycle
- \* Measurement of surface tension and interfacial tension by Pendant Drop method
- \* Live measurement of contact angle, surface tension and interfacial tension without delay

### International Standards or Permissions:

Approved by Iran Nanotechnology Innovation Council



## ➤ Potentiostat-Galvanostat-Electrochemical Impedance Spectroscopy

◆ Sharif Solar Co.

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



### Product Introduction:

The electrochemical measuring device can be considered a complete electrochemical device, if it includes techniques related to potentiostat/galvanostat on the one hand and electrochemical impedance measurement on the other. In potentiostat, standard electrochemical techniques, including linear potential scanning voltammetry, cyclic voltammetry, chronoamperometry, and pulse voltammetry techniques (normal pulse, differential pulse, and square wave), are provided. Its voltage range is  $\pm 5$  or  $\pm 1$  V, measured with a resolution of 0.025% full range. The 8-step amplification system allows measuring currents from 50 picoamps to 1 amp. In galvanostat mode, by applying current with different patterns, it is possible to measure voltage in terms of time (chronopotentiometry) or voltage in terms of current. In the Electrochemical Impedance Spectroscopy (EIS) technique, the frequency range is one mHz to 1 MHz, and by using multiple noise reduction techniques, impedance measurement has become possible with high accuracy. EIS is a powerful tool for studying the corrosion of metals, adsorption and desorption phenomena on the electrode surface, the kinetics of catalytic reactions, and the interface of layers in solar cells and fuel cells. The device is offered in PGS (Potentiostat-Galvanostat) and EIS (Electrochemical Impedance Measurement), and PGE (Potentiostat-Galvanostat-EIS) models.

**Founded:**

2014

### Application:

Characterization of coatings, batteries, solar cells, fuel cells and...

*This product is final B2B equipment.*

### Technical Specifications:

<b>Electrode connections</b>	2, 3 and 4
<b>Potential range (adjustable)</b>	* $\pm 5$ V / $\pm 1$ V * <b>Fine voltage range:</b> (FS)/2, FS/4, FS/8, (FS)/16, FS/32, * FS/64
<b>Possible resolution</b>	0.025% of Scale
<b>Adjust Voltage Resolution (AVR)</b>	0.025%
<b>Maximum current</b>	1 A
<b>Input impedance</b>	100 MegaOhm
<b>Input voltage</b>	100-240 V AC (50-60 Hz) or 24 V DC



**Application:**

- \* Creating nanometer coatings with different thicknesses using stable nano colloidal solutions
- \* The possibility of layering on circular and cylindrical surfaces

➤ **Ultrasonic Spray**

◆ Sharif Solar Co.

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



**Product Introduction:**

For proper layering using various inks or nanoparticle solutions, we have designed the USS-40C ultrasonic spray device. USS-40C is an automatic ultrasonic spray machine model with a CNC X and Y movement module that can adjust the movement speed. As a result, the movement of the ultrasonic nozzle can be programmed, and a specific surface can be sprayed at a particular time. In the ultrasonic spray method, tiny droplets with a narrow size distribution are created through the vibration of the nozzle tip and reach the surface at a relatively low speed. In conventional spray methods, the droplet size is several times larger, and due to the high rate of their collision with the surface, a significant percentage of them are reflected from the surface. For this reason, the ultrasonic spray can create very uniform layers, and due to the possibility of managing droplets' movement, the material loss will be much less.

**Founded:**

2014

*This product is final B2B equipment.*

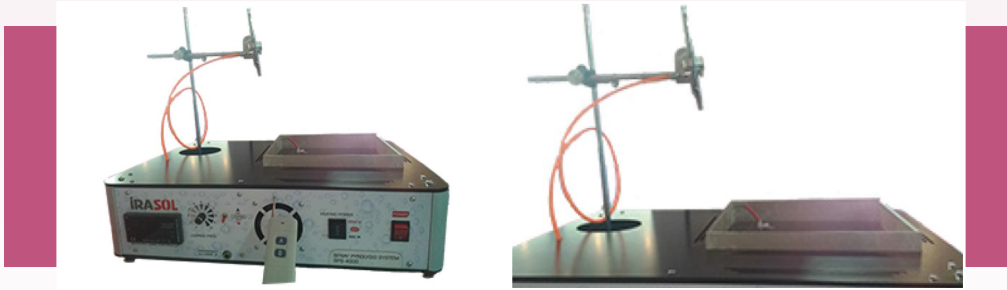
**Technical Specifications:**

<b>Model</b>	USS-4030
<b>Frequency</b>	42 khz
<b>Power</b>	Max 80 w
<b>Nozzle output power</b>	1-15 w
<b>Ultrasonic transducer</b>	PZT
<b>Type of spray nozzle</b>	316 stainless steel
<b>Spray nozzle diameter</b>	0.5 mm
<b>Ambient temperature range</b>	0-40 °C
<b>Syringe pump injection speed</b>	2-100 cm/min
<b>Operation voltage</b>	220 v
<b>Dimensions</b>	35 × 15 × 45 cm

**Advantages:**

- \* High coating uniformity
- \* High use of raw materials and less spraying
- \* High coating thickness control accuracy
- \* No clogging of nozzles
- \* Low maintenance cost





### Application:

- \* Drying spray
- \* Deposition of thin layer of various compounds such as oxides and sulfides, etc
- \* Increasing the hydrophilicity of the surface
- \* Growth of oxide layers on silicon wafer
- \* Cleaning the substrates
- \* Ability to convert it into an oven for baking thin layers

## Pyrolysis Spray

Sharif Solar Co.

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



### Product Introduction:

The pyrolysis spray method is a widespread method in making thin layers. In this method, the solution droplets are thrown from the spray gun at high speed toward the hot surface, and they sit on the surface with good uniformity, coverage, and thicknesses of even 10 nanometers. In the design of this device, an attempt has been made to minimize the effects of the hot plate itself, which is high in other devices. The choice of anti-shock glass for the hot plate was for this purpose. This glass has a very high chemical resistance and is immune to interaction with the sprayed substances. An absorbent layer made of metal nanoparticles has been deposited to fully absorb the optical spectrum of the heating elements and increase the heating speed.

**Founded:**

2014

*This product is final B2B equipment.*

### Technical Specifications:

Device models	* Sps-3000 * Sps-4000
Maximum heating rate (ambient temperature up to °300C)	200 °C/min
The maximum cooling rate (from 300 to 100 °C)	100 °C/min
Maximum operating temperature	450 °C
Maximum heating power	2000 W
Heating area dimensions	23 × 23 cm <sup>2</sup>
Dimensions of heating zone with uniform temperature	15 × 15 cm <sup>2</sup>
Temperature sensor (thermometer)	k-type thermocouple
Type of glass	Schott-NEXTREMA
Power supply	220V AC, 10A



**Application:**

- ✦ Determining the amount of ice adhesion to various metallic and non-metallic surfaces, paints, coatings, car and airplane bodies, satellite antennas, power transmission cables and other surfaces.
- ✦ Obtaining accurate shear-stress between ice and coating in different freezing modes and different temperature and environmental conditions

➤ **Ice and Surface Shear-Stress Measurement Device**

◆ Jikan Surface Nano-Engineering Co.

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



**Product Introduction:**

Jikan IAT-40 can automatically measure the force of adhesion of ice to the surface and the minimum shear-stress force to separate the ice from the surface, at different surfaces.

*This product is final B2B equipment.*

**Technical Specifications:**

Surface temperature resolution	± 0.1 °C
Maximum sample size	80 × 40 mm
Accuracy and resolution of the force sensor	± 250 Pa
Working voltage	-50 -60 Hz
Force monitoring dimensions	1 - 20 mm

**Advantages:**

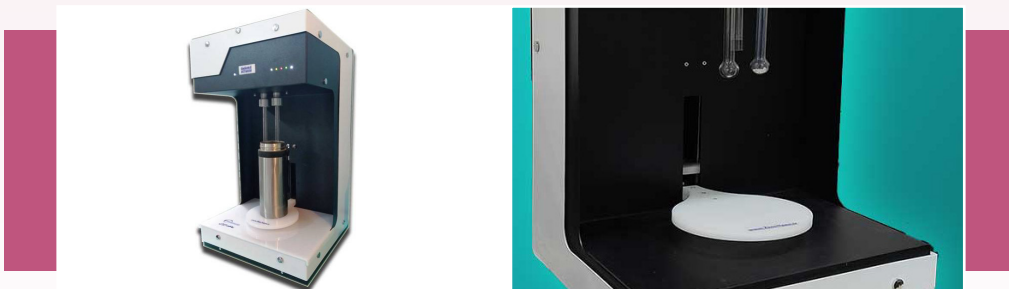
- ✦ Short test time and high measurement accuracy
- ✦ Simple and practical user-interface
- ✦ Ability to customize for different needs
- ✦ Quick access to information
- ✦ Temperature control with high precision
- ✦ Has the exclusive software of Jikan group

**Founded:**

2016

**International Standards or Permissions:**

Approved by Iran Nanotechnology Innovation Council



## ➤ Specific Surface Area measuring (BET&BJH) Device

🏠 ToosNano Co.

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



### Product Introduction:

In many applications, accurate measurement of surface area and porosity is of high importance. One of the most interesting methods to determine the porosity is the BET method, which is based on gas absorption. In this method, a layer of adsorptive molecules is created on the surface. By knowing the average thickness of a molecule, it is possible to calculate the surface occupied by a molecule and measure the total surface area of the sample based on the amount of absorbed material. Considering that this analysis is based on the mechanism of gas absorption and desorption, gases such as krypton, argon and nitrogen are suitable choices for this purpose. Nitrogen is the most commonly used gas, because it is usually easy to access. On the other hand, argon and krypton are expensive, and nitrogen purity is higher than argon and krypton.

**Founded:**

2014

### Application:

Measuring specific surface area and porosity is significant in many applications such as catalysts, Nano adsorbents, compounds and additives, pharmaceuticals and food industries, as well as in Nano structures such as metal nanoparticles, nanotubes, nanofibers, etc.

*This product is final B2B equipment.*

### Technical Specifications:

<b>The measuring principle</b>	Static volumetric method
<b>Absorption gas/steam</b>	N <sub>2</sub> , Ar, Kr, CO <sub>2</sub> , H <sub>2</sub> , O <sub>2</sub> , CH <sub>4</sub> , other non-corrosive gas
<b>Multi-sample measurement</b>	1 port
<b>Specific surface measurement range</b>	0.05 – 3000 m <sup>2</sup> / gr
<b>Port size distribution (diameter)</b>	0.35 ~ 500 nm
<b>Gas port</b>	2
<b>Vacuum pump</b>	Rotary pump

### Advantages:

- \* 1 year warranty
- \* 10 years after sales service



## ➤ Specific Surface Area measuring (BET&BJH) and Chemical adsorption and desorption analysis (TPD-TPR) devices

◆ Towse-E Hesparsazan-E Asia (SENSIRAN) Co.  
www.hesparsazan.com



### Product Introduction:

It is a device capable of measuring BET specific surface, chemical absorption, desorption and temperature programmed regeneration to determine the characteristics of nanostructured materials. It is one of the most widely used devices in determining the characteristics of nanostructured materials, including metal nanoparticles, metal oxide, sulfide, nanotubes, nanofibers, nanoabsorbents, etc. The most important properties of materials that can be measured by this device are: BET level, distribution and density of active sites, absorption properties of nanoparticles, mechanism and regeneration temperature of metal nanooxides. Most of the analyses are based on physical or chemical absorption and temperature programmed techniques. The advantage of these techniques is that they are empirically simpler and inexpensive compared to other spectroscopic methods. Also, the interpretation of the results obtained from these methods is relatively simple and clear in terms of quality and quantity.

**Founded:**

2001

### Application:

#### Some of the catalytic applications are:

- \* Hydro cracking, hydro desulfurization and hydro denitrogenation
- \* Fischer-Tropsch synthesis
- \* Isomerization
- \* Reforming
- \* Fischer-Tropsch synthesis
- \* Cracking and fuel cell

*This product is final B2B equipment.*

### Technical Specifications:

BET specific surface area measurement device and chemical adsorption and desorption analysis (TPR_TPD)	
The material of the sample container	Quartz glass
The material of the pipes	Stainless steel
weight	80 kg
Dimensions (height × length × width)	80 × 65 × 45 cm
Optimal temperature	15-50 °C
Relative humidity	20-80%
Voltage	115-230 V
Frequency	50/60 Hz
power	1800 W

### Advantages:

- \* Temperature control by computer
- \* Thermocouple inside the sample
- \* Software with data analysis capability
- \* Accurate adjustment of gas flow by mass controllers
- \* 1 year warranty
- \* 10 years after sales service



**Application:**

- \* Drawing the adsorption isotherm diagram for the materials
- \* Determining the BET specific surface of materials in a single-point and multi-point manner
- \* Examining the micro pores by Langmuir method
- \* Examining the external surfaces of materials using the T-plot method
- \* Examining the size distribution of pores from the BJH method
- \* Checking the amount of physical absorption of materials

➤ **Pore Size Distribution Determining Device**

◆ Towse-E Hesgarsazan-E Asia (SENSIRAN) Co. [www.hesgarsazan.com](http://www.hesgarsazan.com)



**Product Introduction:**

It is one of the most widely used devices in determining the characteristics of nanostructured materials, including metal nanoparticles, metal oxide, sulfide, nanotubes, nanofibers, nanoabsorbents, etc. The most important properties of materials that can be measured by this device are: BET specific surface area, pore size distribution and physical absorption properties of nanoparticles.

**Founded:**  
2001

*This product is final B2B equipment.*

**Technical Specifications:**

<b>Material</b>	* <b>Sample container:</b> Pyrex * <b>Pipes:</b> stainless steel * <b>Solenoid valve:</b> brass * <b>Injection chamber:</b> steel
<b>Weight</b>	80 kg
<b>Dimensions (height × length × width)</b>	90 × 60 × 70 cm
<b>Maximum temperature</b>	500 °C
<b>Power</b>	300 W
<b>Temperature controllers</b>	PID via PC
<b>Furnace heating rate</b>	1-30 °C/min
<b>Voltage</b>	220 V
<b>Frequency</b>	50/60 Hz
<b>Power</b>	700 W
<b>Optimal temperature</b>	15-50 °C
<b>Relative humidity</b>	20-80%



## ➤ Membrane Gas Separation and Permporometry Systems (MGSPS)

◆ Towse-E Hesgarsazan-E Asia (SENSIRAN) Co. [www.hesgarsazan.com](http://www.hesgarsazan.com)



### Product Introduction:

Today, the membrane industry is one of the growing and new industries in the field of gas separation. Gas separation is used in various sectors of the oil, petrochemical, gas industries, etc.; Therefore, developing some methods to evaluate the produced membranes can be of great importance. These devices should be compatible with all types of gas analyzers such as gas chromatography. The general mechanism of these analyzers is simple but very practical. These devices also have Permporometry. In this case, by combining two flows of inert gas, one of which passes through a saturator, a certain percentage of the solvent passes through the membrane up to about 2%.

**Founded:**

2001

### Application:

- ※ The feasibility of membrane separation at different temperatures and pressures
- ※ The feasibility of membrane separation and Permporometry
- ※ Measuring the pore distribution of membrane surface
- ※ Detecting large holes and cracks in the structure of the microporous membrane

*This product is final B2B equipment.*

### Technical Specifications:

<b>Mass Flow Controller (MFC)</b>	Preparation of feed gas with precise composition
<b>Electric and manual control valves</b>	Changing the direction of gas flows
<b>Manual flow control (Read out)</b>	precise adjustment of gas flows
<b>Furnace (500 °C)</b>	Heating during process testing
<b>Temperature controller</b>	precise adjustment of furnace temperature
<b>Pressure transducer</b>	Reading the gas flow pressure
<b>Membrane process test module</b>	Performing process tests
<b>Saturator</b>	Saturation of gas flow with normal hexane
<b>Back Pressure Regulator</b>	precise adjustment of pressure
<b>Pressure display</b>	Displaying gas flow pressure
<b>Bubbler flowmeter</b>	Measuring the amount of gas flow coming out of the module
<b>Cold Trap compartment</b>	To cool the gas flow
<b>Dimensions (height × length × width)</b>	80 × 80 × 45 cm
<b>Membrane test</b>	<ul style="list-style-type: none"> <li>※ <b>Maximum pressure:</b> 7 bar</li> <li>※ <b>The maximum temperature:</b> 500 °C</li> </ul>
<b>Permporometry test</b>	2 to 50 nm

**Application:**

- \* Antibacterial applications
- \* The heat transfer
- \* Reduce friction
- \* Water and wastewater treatment and identifiers

## ➤ Metal Nanomaterials and Metal Oxide Production (PNC) Device

◆ Payamavaran NanoFanavary Fardanegar Co.

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

**Product Introduction:**

The product of wire electric explosion device is for the production of metal and oxide nano powders and metal nanocolloids. In this device, controlled conditions of gas or liquid environment are created with the help of plasma environment. PNC machine; It is a laboratory device for the production of metal nanoparticles in a liquid medium, which is useful for use in research and educational centers. This technology is able to produce a wide range of metal nanocolloids in a physical way and without the intervention of any chemicals for use in many industrial and research purposes. Nanocolloids of silver, copper, gold, iron, aluminum, molybdenum and nickel are among the products produced with the help of this technology.

**Main Export Destinations:**

The UAE

**Export History:**

Up to 500,000 \$

**Founded:**

2007

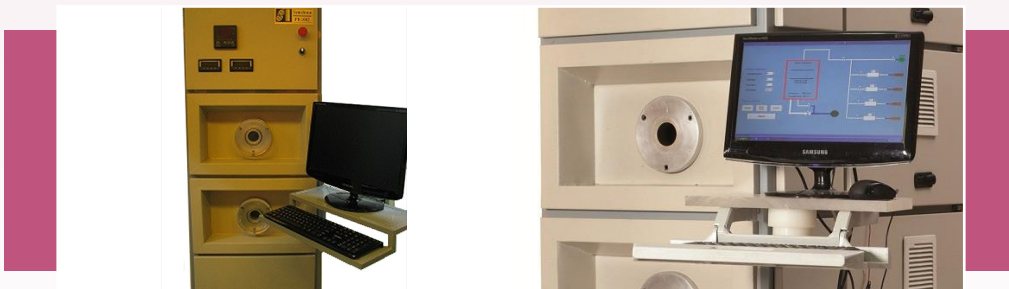
*This product is final B2B equipment.*

**Technical Specifications:**

<b>Required power</b>	1ph 500W 220V AC
<b>Device physical dimensions</b>	55 × 40 × 55 cm
<b>Device weight</b>	40 Kg
<b>Input</b>	thin wire
<b>Output</b>	Metal nano colloid
<b>Output voltage</b>	300-500 V
<b>Maximum wire diameter</b>	0.25 mm
<b>Detonating wire length</b>	2 cm
<b>Average particle size</b>	10-50 nm

**Advantages:**

- \* Easy to use
- \* Reasonable distribution of metal nanocolloids in the relevant solvents
- \* Ability to be produced on both laboratory and industrial scale (mass production) in different concentrations
- \* Eco-friendly
- \* Low cost and high efficiency



**Application:**

- \* Layering of different materials for microfabrication in different forms including single crystals, polycrystals, amorphous and epitaxial growth structures.
- \* Abrasion and corrosion resistant coatings on tools, bearings and drills
- \* Carbon nanotubes
- \* Production of semiconductor devices

➤ **Direct Plasma Chemical Vapor Deposition (DC-PECVD)**

◆ Roshd Nano Fanavaran Co.

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



**Product Introduction:**

Chemical vapor deposition (CVD) is one of the most important coating methods. This method is widely used in both industrial and research field. In fact, this method itself includes a variety of methods and devices that all work based on some common features. These features include: the use of a gaseous mixture as a coating precursor or final product (the final product may not have a coating application (e.g., carbon nanotubes)), the use of a plasma or heat source to encourage reactions between gaseous species, and finally Preparation of conditions for deposition of products on a substrate. The thermal source can be in the form of thermal filaments, microwaves or electric discharge.

Plasma-enhanced chemical vapor deposition (PECVD) is a type of CVD process that the presence of the plasma environment affects all CVD processes and increases the speed and efficiency of related reactions at relatively lower temperatures (compared to the use of the CVD process without the presence of plasma) and promotes This method is often used to produce carbon nanotubes.

**Founded:**

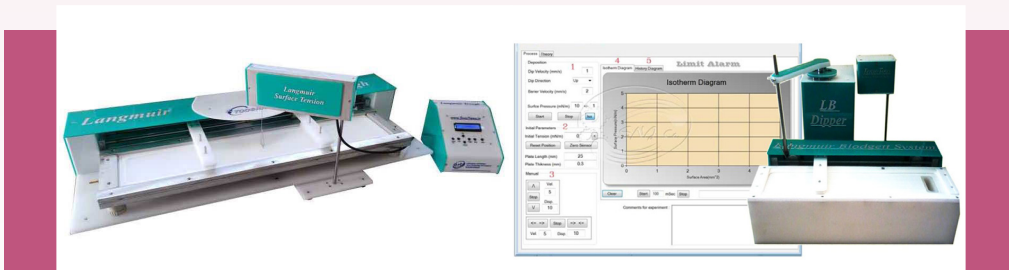
2010

*This product is final B2B equipment.*

**Technical Specifications:**

<b>Device model</b>	DC-PECVD
<b>No. of furnaces</b>	Includes two ovens (diameter of 80 mm and a length of 80 cm)
<b>Maximum temperature of the thermal zone</b>	750°C
<b>The amount of vacuum</b>	$5 \times 10^{-2}$ torr
<b>Reactor</b>	Quartz
<b>Power supply</b>	Direct voltage source up to 1000 V and 100 mA
<b>Gas flow controller</b>	Including two flow controllers of acetylene and hydrogen gases
<b>Device dimensions</b>	160 × 180 × 140 cm





**Application:**

- \* Making cells containing thin films for solar cells
- \* Fabrication of fuel cells membrane with uniform structure and thickness
- \* Layering of smart windows and mirrors with a certain thickness and uniformly
- \* Controlling the thickness and density of optical coatings
- \* Molecular layering in the construction of electronic sensors
- \* Layering in the production of biomaterials
- \* Production of medicinal substances with improved dissolution and dispersion properties

➤ **Langmuir Blodgett Molecular Deposition**

*This product is final B2B equipment.*

◆ ToosNano Co.

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



**Product Introduction:**

The Langmuir-Blodgett (LB) method is one of the most common methods for making organic thin films. It includes the deposition of single molecular layer from a liquid surface onto the selected solid substrate. These monolayers are formed at the interface between liquid and gas. In this method, the layer with the structure of molecular monolayer formation is created on the surface, therefore it has uniformity and order on a molecular scale.

**Technical Specifications:**

<b>Maximum sample size</b>	According to the customer's order
<b>Pond size</b>	According to the customer's order
<b>The ability to control the temperature of the pool</b>	0-60 °C
<b>Immersion speed</b>	0-90 mm/min
<b>Speed limits performance</b>	0-90 mm/min
<b>Displacement accuracy</b>	1%
<b>Displacement range of the arm</b>	Variable (according to the size of the pond)
<b>Measurement range</b>	Maximum 2000 mN/m with accuracy of 101 mN/m
<b>Device weight</b>	10 kg
<b>Inbuilt ToosNano LB software with capabilities of</b>	<ul style="list-style-type: none"> <li>* Setting process parameters</li> <li>* Displaying the process diagram</li> <li>* Recording and saving process data in Excel file format</li> </ul>

**Advantages:**

- \* Accurate control of the thickness of the coating
- \* Uniform deposition of single layer in a large area
- \* Very good structural order in a wide area and the possibility of building structures including several layers of different materials
- \* The possibility of depositing layers on different types of substrates
- \* Low cost of the process (no need for vacuum or plasma environments during the process)

**Founded:**

2014



## ➤ Cathodic Arc Vacuum Coating System

◆ Khala Poushan Felez (KPF) Co.

[www.khpf.co.ir](http://www.khpf.co.ir)



### Product Introduction:

The cathodic arc physical vapor coating is an industrial process that is widely used to apply high quality thin film coatings. This process is carried out in vacuum environment and using specially designed deposition heads. Physical vapor deposition layer with cathodic arc can be done in DC or pulse modes. In each of the mentioned modes, the voltage created by the power supply causes an electric arc between the anode and the cathode. The arc current is concentrated on a very small surface of the cathode and creates a very high current density ( $\sim 10^{12}$  A/m<sup>2</sup>). This high current density is associated with high power density ( $\sim 10^{13}$  W/m<sup>2</sup>) and through a local phase transformation on the surface of the target (cathode), it causes complete ionization of the surface and creates deposition plasma. The created plasma spreads rapidly towards the substrate (anode). During deposition, the kinetic energy of plasma particles ranges from 20 electron volts for light elements to 200 electron volts for heavy elements.

**Founded:**

2011

### Application:

- ※ Coating very hard layers, super hard layers and nano composite coatings including TiN, TiAlN, CrN, ZrN, AlCrTiN and TiAlSiN on tools in order to optimize their performance and life.
- ※ Coating amorphous carbon diamond-like films by deposition of carbon ions

*This product is final B2B equipment.*

### Technical Specifications:

<b>Target dimensions</b>	4 inches
<b>Cathodic arc evaporation sources</b>	18
<b>High vacuum system</b>	Rotary, roots and diffusion pumps and diffusion holding pump to prevent energy dissipation
<b>Mass flow controller</b>	4
<b>Chamber</b>	Double-wall vacuum chamber
<b>Chamber dimensions (diameter × height)</b>	1600 × 1800 mm

### Advantages:

- ※ High ion energy
- ※ The possibility of depositing the substrate at a lower temperature
- ※ Lower price compared to similar products



**Application:**

- \* Determining the growth direction of crystalline materials and crystal plates
- \* Determining crystal defects and grain boundaries
- \* Detecting areas with residual stress
- \* Identifying the chemical composition of inorganic phases

➤ **Transmission Electron Microscopes (TEM)**

◆ Ara Research Co.

[www.ara-research.com](http://www.ara-research.com)



**Product Introduction:**

Transmission electron microscopes (TEM) are specific tools to determine the structure and morphology of materials, which makes microstructural studies of materials with high resolving power and very high magnification possible. In addition, these microscopes can be used to study crystal structures, symmetry, crystal defects and orientation. These applications have made TEM a significant tool in many advanced researches in physics, chemistry, crystallography, materials science, and biology. TEM is capable of imaging the microstructure of materials with a magnification of 1,000 to 1,000,000 times with a resolving power of less than 1 nm. TEM is also capable of elemental analysis, determining the structure and crystal direction of components as small as 30 nanometers both qualitatively and quantitatively.

**Founded:**

1998

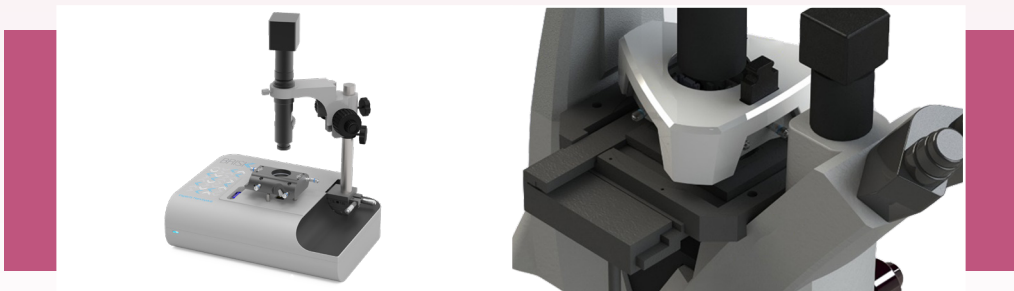
*This product is final B2B equipment.*

**Technical Specifications:**

<b>Resolution (nm) at 80 KV</b>	* <b>Point:</b> 0.50 * <b>Meshy:</b> 0.34
<b>Acceleration Voltage</b>	* <b>Range:</b> 50KV × 80KV * <b>Stability:</b> 10 <sup>-6</sup> × 8
<b>Magnification</b>	* <b>Range:</b> 150X to 400,000X * <b>Steps:</b> 16
<b>Refraction</b>	* >1.5 μm diameter, selected apertures (SAD) * >3 μm diameter, selected by micro-beam illumination
<b>Projector Lenses</b>	* <b>Number of lenses:</b> 3 factory level electromagnetic projector lenses * <b>Stability:</b> 10 <sup>-6</sup> × 6

**Advantages:**

- \* Lower price compared to similar products
- \* Of high efficiency and performance



## ➤ Atomic Force Microscope (AFM) with Kit

◆ Ara Research Co.

[www.ara-research.com](http://www.ara-research.com)



### Product Introduction:

Atomic force microscope (AFM) is a tool for observing samples with nanometer dimensions and examining their surface topography. In AFM, weak forces such as van der Waals forces and capillarity between the probe tip and the sample surface are used to form a topographic image of the sample surface. Therefore, there is no limit to examine the surface of the sample unlike scanning tunneling microscopes. Atomic force microscope is capable of imaging with atomic spatial resolution of conductive, non-conductive and even biological samples. This microscope plays a significant role in the progress of various sciences including electronics, nanotechnology and materials science. Today, different commercial devices with similar basics and different working modes have been released, which differ from each other in terms of accuracy and image quality.

**Founded:**

1998

### Application:

As the most essential tool in nano projects, in addition to topography and imaging at the molecular and atomic scale, AFM has the ability to determine the physical, chemical, mechanical, electronic, and magnetic properties of materials at the nano scale. In addition, this device can take images in liquid environment and is widely used for pharmaceutical and food industries.

*This product is final B2B equipment.*

### Technical Specifications:

<b>XY Scanner</b>	<ul style="list-style-type: none"> <li>* <b>Surface scanning range:</b> 50 nm</li> <li>* <b>Surface displacement accuracy:</b> 1 nm</li> </ul>
<b>Z Scanner</b>	<ul style="list-style-type: none"> <li>* <b>Vertical displacement range:</b> 4 nm</li> <li>* <b>Vertical displacement accuracy:</b> 0.1 μm</li> </ul>
<b>XY Stage</b>	<ul style="list-style-type: none"> <li>* <b>Type:</b> Motorized Software-Controlled</li> <li>* <b>Surface displacement range:</b> 15 mm</li> <li>* <b>Surface displacement accuracy:</b> 40 nm</li> </ul>
<b>Z Stage</b>	<ul style="list-style-type: none"> <li>* <b>Type:</b> Auto Fast Approach</li> <li>* <b>Vertical displacement range:</b> 15 mm</li> <li>* <b>Accuracy of vertical displacement:</b> 40 nm</li> </ul>
<b>Sample dimensions</b>	<ul style="list-style-type: none"> <li>* <b>Surface dimensions of the sample:</b> diameter 2 cm</li> <li>* <b>Sample thickness:</b> 1 cm</li> <li>* <b>Sample roughness in dimensions of fifty micrometers square:</b> less than 4 micrometers</li> </ul>

### Advantages:

- \* Working in vacuum unlike SEM and TEM (suitable for imaging live aerobic samples)
- \* No need for sample preparation unlike SEM and TEM
- \* Reasonable price and low energy consumption unlike SEM and TEM
- \* Wide range of applications
- \* No sample type restrictions unlike STM, TEM and SEM
- \* Appropriate laboratory size



**Application:**

Imaging, spectroscopy and lithography

➤ **Scanning Probe Microscope (SPM)**

◆ **Nanotechnology System Corporation**

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



**Product Introduction:**

In today's world, identifying and investigating materials and systems using characterization systems has become an important and unavoidable part of advanced technologies and research. Scanning probe microscopes are one of the most practical characterization systems. This device, which includes a set of techniques, has the ability to examine the surface of materials with high resolution in the range of nanometers and even angstroms. In a general view, scanning probe microscopy (SPM) is a comprehensive title for a wide set of techniques that use a probe (needle (tip)) to scan the surface of materials at the nanoscale and even angstrom scale. Its output is topographic images of a special property of the material's surface. The combined scanning tunneling and atomic force microscopies, which is also known as the scanning probe, is a combination of two STM and AFM devices. In this device, the imaging mode can be changed by replacing the cantilever connected to the device cap. In addition, compared to similar samples, with the help of this device, it is possible to change the imaging mode easily and only by changing the tip.

**Founded:**

2007

*This product is final B2B equipment.*

**Technical Specifications:**

AFM	
<b>X,Y scan range</b>	10 μm
<b>Z scan range</b>	3 μm
<b>Lateral resolution</b>	0.13 nm
<b>Vertical resolution</b>	0.05 nm
<b>Maximum sample size</b>	20 mm
<b>Micro XY positioning stage</b>	2.5 μm
<b>DAC/ADC scanner resolution</b>	16 bit
STM	
<b>Electronic size</b>	55 × 55 × 18 cm
<b>Power supply</b>	220v, 50 Hz, 1A
<b>Maximum scanning range</b>	8 μm
<b>Maximum range of Z</b>	3 μm
<b>Z resolution extraction</b>	0.045 nm
<b>XY resolution extraction</b>	0.12 nm



**Application:**

Imaging surfaces (at the atomic scale)

➤ **Scanning Tunneling Microscope (STM)**

◆ **Nanotechnology System Corporation**

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



**Product Introduction:**

Scanning Tunneling Microscope (STM) is one of the first microscopes that was able to produce images of material surfaces with atomic precision. An invention that won the Nobel Prize for its inventors. The formation of an image of the sample surface in the scanning tunneling microscope is based on establishing a tunnel flow between the tip of the microscope probe and the sample surface. By establishing a tunneling current between the tip of the microscope probe and the surface of the sample and changes in the tunneling current, an image of the topography of the atoms on the surface of the sample is obtained. In addition this microscope allows us to examine some properties of the sample surface such as magnetic properties, superconductivity, molecular absorption, as well as separation or displacement of atoms.

**Founded:**

2007

*This product is final B2B equipment.*

**Technical Specifications:**

<b>Electronic size</b>	55 × 55 × 18 cm
<b>Power supply</b>	220v, 50 Hz, 1A
<b>Maximum scanning range</b>	8 μm
<b>Maximum range of Z</b>	3 μm
<b>Z resolution extraction</b>	0.045 nm
<b>XY resolution extraction</b>	0.12 nm

**Advantages:**

- \* Providing a completely real 3D image of the surface
- \* High resolution of about 0.1 nm
- \* Ability to analyze at zero Kelvin temperature
- \* Absence of atmospheric restrictions for analysis
- \* Can be used for organic materials



## ➤ Atomic Force Microscope (AFM)

### ◆ Nanotechnology System Corporation

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



#### Product Introduction:

Atomic force microscope (AFM) is a tool for observing samples with nanometer dimensions and examining their surface topography. The functional mechanism of atomic force microscopes to form a topographic image of the sample surface is based on weak forces such as van der Waals forces and capillarity between the probe tip and the sample surface. Therefore, in this device, unlike scanning tunneling microscopes, there is no limit to examine the surface of the sample.

Atomic force microscopes are capable of imaging conductive, non-conductive and even biological samples with atomic spatial resolution. This microscope plays a significant role in the progress of various sciences including electronics, nanotechnology and material science. Today, different commercial devices with similar basics and different operating modes have been released, which differ from each other in terms of accuracy and image quality.

**Founded:**

2007

#### Application:

- \* Used in many studies, to write, manipulate and move individual xenon atoms, molecules, silicon and polymer surfaces.
- \* For all types of nanolithography and production of nanostructures and nanomachining

*This product is final B2B equipment.*

#### Technical Specifications:

<b>X,Y scan range</b>	10 $\mu\text{m}$
<b>Z scan range</b>	3 $\mu\text{m}$
<b>Lateral resolution</b>	0.13 nm
<b>Vertical resolution</b>	0.05 nm
<b>Maximum sample size</b>	20 mm
<b>Micro XY positioning stage</b>	2.5 $\mu\text{m}$
<b>DAC/ADC scanner resolution</b>	16 bit



## ➤ Solar Cell Current-Voltage Measuring Device

◆ Sharif Solar Co.

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



### Product Introduction:

The ideal solution for current-voltage measurement of solar cell devices in the dark and under simulated solar light is to use an I-V detector. Some critical parameters, such as short circuit current ( $J_{sc}$ ), open circuit voltage ( $V_{oc}$ ), and fill factor ( $ff$ ), can be obtained using the I-V curve. The applied voltage range is  $\pm 5V$ , and the scan speed is adjustable.

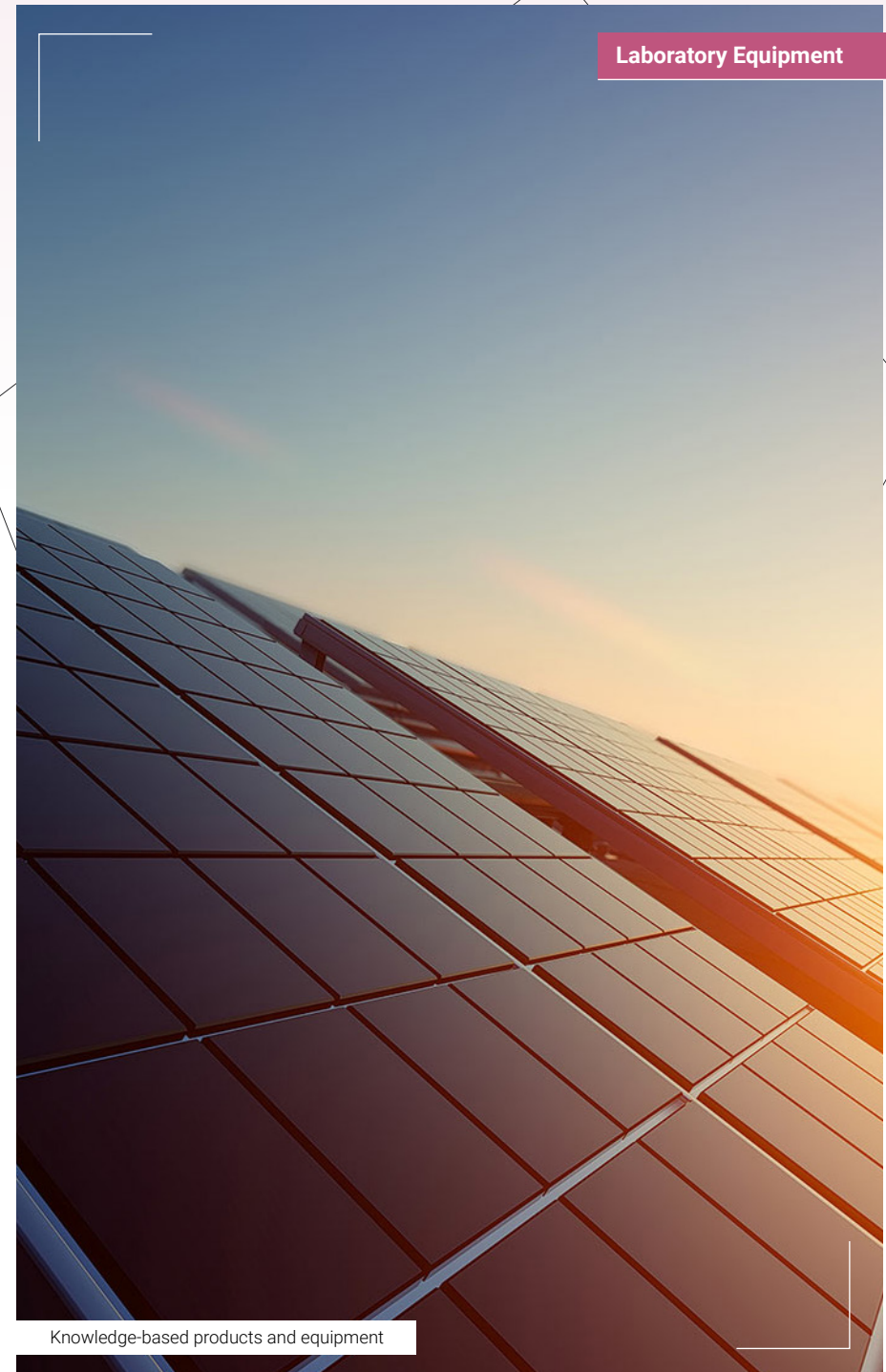
*This product is final B2B equipment.*

### Technical Specifications:

Electrode connections	2, 3 & 4
Potential range (adjustable)	$\pm 5 V / \pm 1 V$
Possible clarity	%0.025 of Scale
Adjuste Voltage Resolution (AVR)	%0.025
Maximum current	1A
input voltage	100-240 V AC (50-60 Hz)

**Founded:**

2014



Knowledge-based products and equipment





**Application:**

- \* Measurement of sample mobility
- \* Density measurement of sample carriers
- \* Determining the type of material carriers

➤ **Hall Effect and Surface Resistance Measurement System**

◆ Sharif Solar Co.

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



**Product Introduction:**

In the research of semiconductor materials such as thin film solar cells, LED, and TCO layers, it is necessary to measure the characteristics of the semiconductor layer. The desired attributes in this field are surface resistance, mobility, the density of carriers, and the type of carriers. Using an alternating system and unique noise reduction technology, the HSR-24AC system can measure the parameters of layered semiconductors such as CIGS, organic materials, and perovskite layers with very high resistance.

**Founded:**

2014

*This product is final B2B equipment.*

**Technical Specifications:**

<b>Device dimensions</b>	25 × 30 × 30 cm <sup>3</sup>
<b>Type</b>	AC
<b>Maximum field intensity</b>	1.5 T p.p
<b>Frequency range</b>	0-100 Hz
<b>Minimum measurable Hall voltage</b>	10 nV
<b>Maximum surface resistance of the sample</b>	10 Giga ohm



**Application:**

- \* Electric power industry (regional electric power companies, electric power distribution companies, power plants)
- \* Mapping
- \* Dam construction
- \* Construction
- \* Mining

➤ **Laser Image Measuring Dimensions (LIMOD) Device**

🏠 **Vira Kavir Co.**

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



**Product Introduction:**

This device is used for various types of remote measurement without any contact with objects, it can measure the diameter of objects, their distances and angles. For example, one of the main applications of this product is to determine the type of wire for long-distance power transmission lines up to a distance of 40 meters. In order to determine the type of wire in power transmission lines, it is necessary to cut off the power of the transmission line and climb the towers of power transmission lines which are usually up to 40 meters high and then measure the diameter of the wire with a caliper and determine the type of wire by counting the strands of wire. Using The LIMOD device allows determining the type of wire without cutting off the power of the transmission line and therefore facilitates climbing the tower.

**Founded:**  
2018

*This product is final B2B equipment.*

**Technical Specifications:**

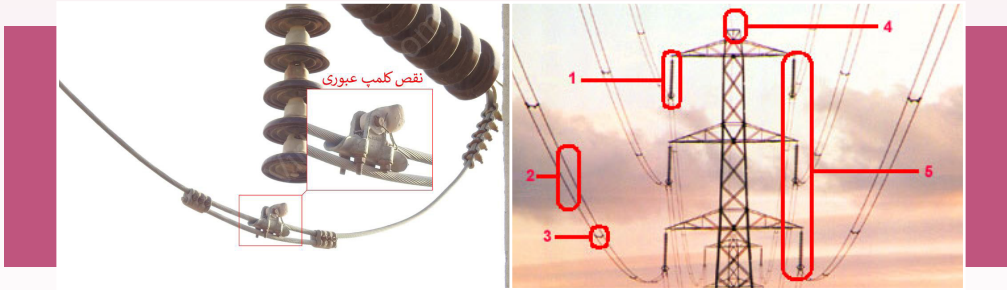
<b>Camera specifications</b>	<ul style="list-style-type: none"> <li>* 8 megapixel focus</li> <li>* x160 zoom</li> <li>* 0.4 seconds Resolution</li> </ul>
<b>laser rangefinder system specifications</b>	<ul style="list-style-type: none"> <li>* <b>Dimensions:</b> 16 × 21 × 27 cm</li> <li>* <b>Weight:</b> 0.245 kg</li> <li>* Laser wavelength: 635 nm</li> <li>* <b>Measurement accuracy:</b> ± 1.5 mm</li> </ul>

**Advantages:**

High scalability

**International Standards or Permissions:**

MIL-PRF-810c



## ➤ Automatic Fault Detection in Power Transmission Lines (AFTL) | Vira Label

➤ Vira Kavir Co.

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



### Product Introduction:

**AFTL:** An AI-based (artificial intelligence-based) software that provides intelligent fault detection and troubleshooting of transmission lines for repairs before they go out of circuit. In general, in order to detect the faults in power lines, The technician climbs the transmission lines towers and prepares and sends the inspection and defect report from every single tower. By using this software, there is no need to climb the power transmission line towers. First, the drone or unmannnd aerial vehicle flies and takes pictures of all the the power lines equipment, and then these pictures are reviewed, analyzed and diagnosed by AFTL. At the end, the defect report is generated completely automatically according to the standard format of the specialized parent company of Tavanir.

**Viral Label:** Using this software, users can make one or more identifications in the images taken by a drone or a regular camera in the target locations. In fact, building an accurate and extensive database to use in deep learning-based networks with high accuracy and speed has been made possible by this software. The software output contains two separate folders. The first folder contains the assigned IDs and the second one contains the raw images and a csv file which includes the coordinates and ID type. In the next steps, the contents of this folder will be used for training. Also, this software has the ability to automatically create a pdf report from the generated IDs.

**Founded:**

2018

### Application:

Application of AFTL:	Application of Viral Label:
<ul style="list-style-type: none"> <li>* Regional electric power companies</li> <li>* Electric power distribution companies</li> <li>* Power plants</li> <li>* Gas company</li> </ul>	<ul style="list-style-type: none"> <li>* Electric power industry, regional electric power companies, electric power distribution companies and power plants</li> <li>* Agriculture, horticulture and forestry</li> <li>* Mining (extraction, exploitation and processing)</li> <li>* Traffic control</li> <li>* Face recognition</li> </ul>

*These products are final B2B equipment.*

### Technical Specifications:

AFTL	
<b>Comprehensive and complete troubleshooting</b>	The ability to detect 80 defects of transmission and super distribution lines simultaneously
<b>Technology and programming language</b>	Python
<b>Database</b>	MYSQL
<b>Operating System</b>	LINUX/UNIX
<b>Hardware platform</b>	Server Based
<b>Software type</b>	Internet-based
<b>Ability to run in browsers</b>	Chrome, Firefox
<b>The possibility of software development</b>	It is possible to develop the software upon the user's request.
<b>Simultaneous use</b>	Multiple users can use it simultaneously
Viral Label	
<b>Programming language</b>	# C
<b>software</b>	The software can be installed as a package (Setup)

### Advantages:

AFTL:	Viral Label:
<ul style="list-style-type: none"> <li>* Intelligent diagnosis of all types of power transmission line errors and image extraction and web-based report</li> <li>* High accuracy and speed</li> <li>* Determining the general condition of the tower</li> <li>* Immediate defect reporting</li> <li>* The ability to display the transmission line on the map</li> <li>* Automatic preparation of error reports at high speed</li> <li>* Extensive and eexclusive database</li> </ul>	<ul style="list-style-type: none"> <li>* The possibility of testing and modifying the assigned IDs</li> <li>* Having a comprehensive guide</li> <li>* No need for a professional expert to run the software</li> <li>* Easy installation</li> </ul>



### ➤ 4-Terminal Characterization Device (Specially for Transistors)

◆ Roshd Nano Fanavaran Co.

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



#### Product Introduction:

This system has electronic circuits sensitive to low current and is used to characterize the current-voltage of the transistor. In order to investigate the performance of the transistor, we need to draw the characteristic curves of the transistor (measurement of the drain current according to the gate-source and drain-source voltage). Therefore, four connection channels are needed to characterize the transistor. These four channels are connected to the gate, drain, source and body, so that they can sweep the voltage in a certain way and measure the current with high accuracy.

**Founded:**

2010

#### Application:

Transistor characterization and electrical characteristic curve drawing

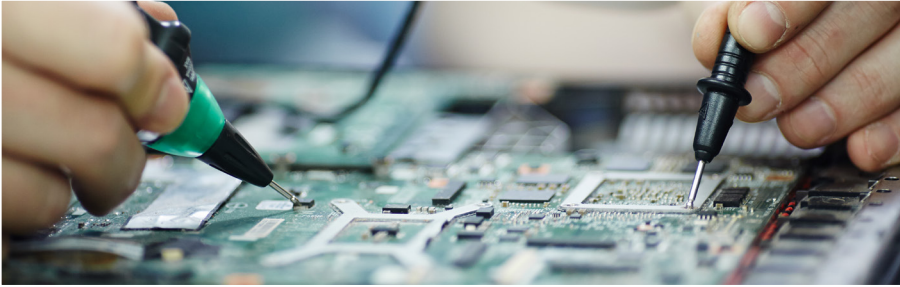
*This product is final B2B equipment.*

#### Technical Specifications:

<b>Current range</b>	10 nanoamps to 15 milliamps
<b>Voltage range</b>	-15 to +15 volts
<b>Measurement accuracy</b>	1 nanoampere (current)
<b>Voltage measurement accuracy</b>	100 microvolts

#### Advantages:

Has very accurate electronic circuits for characterizing the current/voltage of devices



## ➤ I-V Characteristic Tracer

◆ Roshd Nano Fanavaran Co.

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



### Product Introduction:

This device includes accurate current measurement electronic circuits and it is used to characterize the current-voltage of devices - especially sensors. One of the most important methods of characterizing electronic devices is to find the current-voltage diagram in different modes of its operation. With this, a lot of information about the features of that device is obtained. This device has two 15 and 50 volt power supply sections, and its 50 volt voltage is one of the special features of the device. The accuracy of measuring the current of 1 nanoampere is one of the special challenges and advantages of the device.

**Founded:**

2010

### Application:

- \* Characterization of various types of sensors, optical devices, solar cells, etc
- \* Drawing the voltage current curve

*This product is final B2B equipment.*

### Technical Specifications:

<b>Current range</b>	10 nanoamps to 15 milliamps
<b>Voltage range</b>	-15 to +50 volts
<b>Measurement accuracy</b>	1 nanoampere (current)
<b>Voltage measurement accuracy</b>	100 mV

### Advantages:

Very accurate electronic circuits for current/voltage characterization of devices



**Application:**

- \* MEMS laboratories to eliminate residues of the lithography process
- \* Textile laboratories for making hydrophilic fabrics (of normal fabrics) by plasma gases such as nitrogen, oxygen

➤ **Asher Plasma Cleaning Device**

◆ Roshd Nano Fanavaran Co.

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



**Product Introduction:**

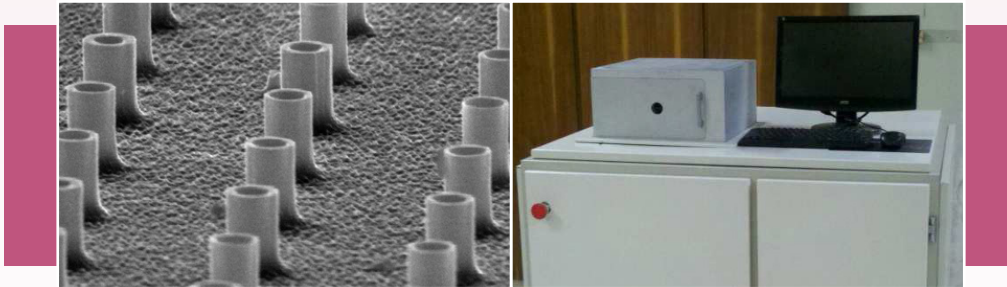
In this product, the design of the plasma system is used as a dry remover, and by controlling the amount of gas entering the reactor, the power and time of the applied plasma, different surface properties are created. This property is used in many industries to surface functionalization.

**Founded:**  
2010

*This product is final B2B equipment.*

**Technical Specifications:**

Ground (base) vacuum	50 millitorr
Operating vacuum	400-700 millitorr
RF power	100 watts
Input gas	Oxygen
System control	Automatically



## ➤ Vertical Silicone Removal Device Deep Reactive Ion Etching (DRIE)

◆ Roshd Nano Fanavaran Co.

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



### Product Introduction:

The vertical silicon removal device is one of the common devices present in electronic fabs and micro/nano electronic laboratories, through which dry removal of silicon is done. The process designed for this device is such that it differentiates it from other existing devices. This device does not even use gases similar to other processes in the world, and deep and vertical removal of silicon takes place in it with an innovative structure. This product has an international patent and many articles have been published using it. It includes vacuum chamber, mechanical pumps and roots, radio frequency power source to create plasma, impedance matching network for different types of gases and different amounts, inlet gas controller (Mass Flow Controller (MFC)), digital program and fully automatic control for the user.

**Founded:**

2010

### Application:

- \* In nano-related laboratories and research institutes
- \* Electronics and semiconductor devices
- \* Making acceleration sensors
- \* MEMS devices
- \* Type AFM (Atomic Force Microscopy)

*This product is final B2B equipment.*

### Technical Specifications:

<b>Operating vacuum</b>	380 volts
<b>RF power</b>	300 watts
<b>Input gases</b>	Oxygen, hydrogen and SF6
<b>Pressure</b>	The ground pressure is 50 millitorr and the working pressure is 800 millitorr
<b>Cooling system</b>	Water-circulation

### Advantages:

The ability to control processes in a repeatable way



## ➤ Automatic 7-Stage Wet Etching System

◆ Samaneh Tajhiz Danesh Co.

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



### Product Introduction:

Etching or removal is one of the suitable methods to obtain structures with arbitrary shapes and complex geometries. This method is usually used for loading in the manufacture of dental implants. In this method, etching is done in several steps and with different solutions. After each etching step, a washing step is done in water with alcohol. This will destroy the effects of the previous steps. The removal of each step takes place under a controlled time, and after this time the sample will be burned and rejected. In this process, all stones must be continuously charged. All these steps are done with a central controller and the samples are moved automatically by a system with 2 degrees of freedom.

**Founded:**

2012

### Application:

- \* Automatic etching according to time
- \* Fabrication of micro sensors
- \* Fabrication of nano and micro structures
- \* Fabrication of microfluidic, MEMS, Bio and microelectronic devices
- \* Production of dental implants according to production instructions in 7 etching steps

*This product is final B2B equipment.*

### Technical Specifications:

<b>Body Material</b>	Polyethylene
<b>No. Sinks</b>	Seven 3-litres sinks
<b>Sink Dimensions</b>	35 × 25
<b>Tank</b>	21 Tanks to store and continuously filling the sinks
<b>Filling and emptying procedure</b>	Automatic filling and emptying over time
<b>Parts displacement</b>	Automatically by the system with two degrees of freedom

### Advantages:

- \* Suction hood to remove toxic fumes
- \* 1 year warranty
- \* 5 years after sales service





### Application:

- ※ Automatic etching according to a specific time
- ※ Fabrication of micro sensors
- ※ Fabrication of nano and micro structures
- ※ Fabrication of microfluidic, MEMS, Bio and microelectronic devices

## ➤ Advanced Wet Etching Cell

◆ Samaneh Tajhiz Danesh Co.

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



### Product Introduction:

Wet etching is one of the subtractive manufacturing methods that is used in the manufacturing of devices on a micro and nano scale. In this method, a removing fluid, which is usually acid or base, is used to remove the substrate or the material on it. This fluid has a certain concentration and a certain temperature. With its polyethylene body, this product has the ability to resist corrosive solutions and by providing a favorable environment for removal, it enables the etching of different substrates inside the solution (the temperature of the bath can be adjusted). On the other hand, this system, having a two-level lift, provides the possibility of carrying and placing the substrates in a controlled manner and for a certain period of time inside the bath. On the other hand, by determining the sequence of transfer time between sinks, different materials can be used for etching substrates.

**Founded:**

2012

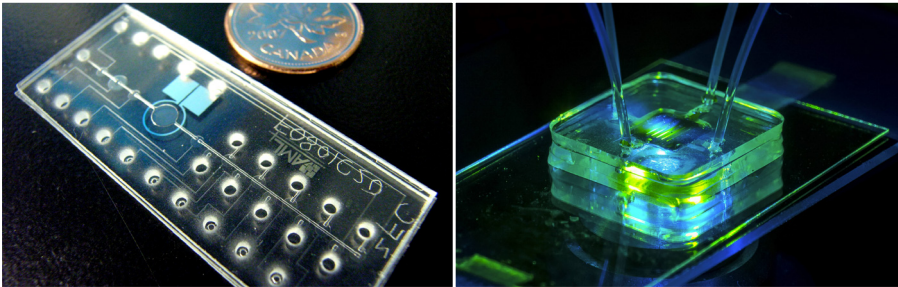
*This product is final B2B equipment.*

### Technical Specifications:

<b>Body Material</b>	Polyethylene
<b>Anti-acid sinks</b>	Double anti-acid polypropylene sinks for acid or base varnishing
<b>Electromagnetic stirrer system</b>	Special stirrer built into the bottom of the etching sink from 60 to 300 rpm
<b>The body of the main etching system</b>	Anti-acid body resistant to acid and alkaline corrosion
<b>Solution temperature control board</b>	Controlling the temperature of the etching solution from ambient temperature to 60°C with an accuracy of 1°C

### Advantages:

- ※ Warranty: 1 year
- ※ After sales service: 5 years



### Application:

- \* Coating of polymer materials and PDMS
- \* Making micro and nano scale devices
- \* Making MEMS sensors
- \* Making micro channels

## ► Pilot Microfluidic Laboratory

◆ Samaneh Tajhiz Danesh Co.

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



### Product Introduction:

The microfluidic laboratory is one of the new devices that provides the possibility of wafer or substrate coating as well as washing, etching and lithography at the same time and in a completely safe environment. This work is done in an integrated set to build systems based on soft lithography. By installing a spin coater with a teflon bowl inside an anti-acid assembly, this set provides the possibility of spin coating, photoresist stripping or etching, as well as illumination by a UV lamp inside the contact lithography system. Also, in another part of the machine, by means of a desiccator system, it is possible to debubble the coating or solution.

**Founded:**

2012

*This product is final B2B equipment.*

### Technical Specifications:

- \* Spin coater with washing capability integrated in the set
- \* Saving the speed profile consisting of 12 sections
- \* Ability to display online speed profile on the screen
- \* The possibility of creating rotational speed up to 5000 rpm
- \* Data entry and display on the LCD touch screen
- \* Injection of neutral gas into the chamber
- \* Ability to work with wafers up to 6 inches
- \* Anti-acid sink for washing
- \* Heating system and solution temperature control
- \* Timer to control the heating time of the solution
- \* Contact lithography with UV light and providing 375 nm or 420 nm light
- \* Setting the light intensity from 0 to %100
- \* The ability to adjust the lighting duration
- \* The installed desiccator inside the hood
- \* Syringe pump with controlled fluid injection

### Advantages:

- \* Warranty: 1 year
- \* After sales service: 5 years



## ➤ Limited Production Line of Micron Scale Tools

◆ Samaneh Tajhiz Danesh Co.

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



### Product Introduction:

The production of micron-scale tools requires a set of equipment that can perform all the processes required for production in one line. The present collection allows the user to perform all operations including sample preparation, lithography, coating, etching and bonding. This product includes three sets and can be used for the following:

For rotary coating, post-coating operations, limited etching, time-controlled etching and automatic system of exiting the etching solution and washing, special positive pressure rack for lithography and complete motorized lithography system with five degrees of freedom along with digital microscope.

**Founded:**

2012

### Application:

- \* Manufacturing micron scale equipment and tools in limited quantities
- \* Manufacturing MEMS and nano sensors
- \* Manufacturing microelectronic components and circuits
- \* Implementing these components and circuits on the substrate
- \* Manufacturing microfluidic laboratory sets

*This product is final B2B equipment.*

### Technical Specifications:

<b>Body material</b>	Polyethylene
<b>Solvent controlled heating</b>	Heating and circulation of water in the hose
<b>Stirring system</b>	4 magnetic stirrer stations
<b>Steam hood</b>	Hazardous gases suction box
<b>Spin coater system</b>	With different drain valve and lock
<b>Lifter</b>	Bi-axis automatic motorized
<b>Different guns</b>	Nitrogen or DI Water
<b>Safety door</b>	Easily accesible
<b>Mask Aligner</b>	Three-degree mask leveler
<b>Digital camera</b>	Two-degree camera movement
<b>Training and technical support</b>	In the training and remote center (for free)

### Advantages:

- \* Warranty: 1 year
- \* After sales service: 5 years



## ➤ Alignment Module with 5 Degrees of Freedom

◆ Samaneh Tajhiz Danesh Co.

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



### Product Introduction:

In processes that require more than one lithography step or are performed on diced wafer pieces, mask alignment on the wafer is of particular importance. Due to their high price, the use of mask aligner devices for low-cost laboratory work is not very cost-effective and is mostly not justified. The proposed alignment module, which is useful in such cases, is a portable set that can be placed under the microscope and can also be placed inside the UV exposure device.

**Founded:**

2012

### Application:

Alignment of mask and substrate in the manufacture of MEMS, micro and nano devices, application in precise, metallurgical measurements, study and photography under the microscope

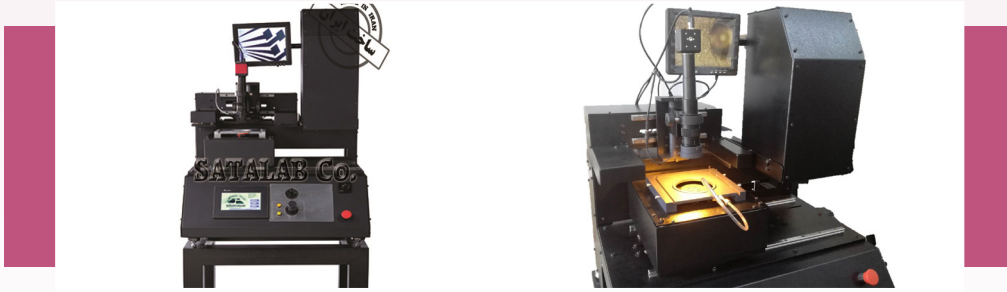
*This product is final B2B equipment.*

### Technical Specifications:

- \* Moving -5degree modules with the help of a joystick
- \* Ability to clamp mask and substrate with the help of vacuum
- \* Ability to choose substrate with different dimensions
- \* Precise positioning of the wafer on the bottom plate of the glass or talc (talcum) mask
- \* All aluminum body with hard anodizing coating
- \* The dimensions of the lower two-degree table in millimeters: 300L × 300W × 80H
- \* Dimensions of the three-degree leveling table in mm: 200L × 200W × 80H
- \* Adjustable bases to level the surface of the device

### Advantages:

- \* Warranty: 1 year
- \* After sales service: 5 years



## ➤ Two-Way Motorized Mask Aligner Lithography System

◆ Samaneh Tajhiz Danesh Co.

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



### Product Introduction:

For lithography of photoresist materials, mask aligner system is used in several steps. Among the applications of this device, we can mention fields such as microfluidics, making MEMS & NEMS sensors, in microelectronics, in physics, etc. With the ability to move the stage in 4 axes with high precision, this system provides the possibility of aligning the substrate with the mask, and it is also possible to adjust the minimum displacement of the stages using the volume. Also, by using another joystick, two-degree movement of the camera on the mask can be achieved, which can be used to align silkscreen layers (marking layers). This system provides the possibility of creating a clean room without being placed inside a clean room by using a filter and a HEPA hood, and with a completely steel body, it improves the ability to use it inside a clean room.

**Founded:**

2012

### Application:

Manufacturing MEMS sensors, microfluidics, LAB on Chip sampling chips, microelectronics and electronic chip manufacturing, etc.

*This product is final B2B equipment.*

### Technical Specifications:

<b>Display</b>	7" HMI
<b>Alignment mechanism</b>	Motor axis X, Y, Z, $\theta$
<b>Inspection method</b>	X, Y motorized microscope
<b>The light source</b>	365 nm monochromatic LED
<b>Substrate and mask holder</b>	4" & 5"
<b>Light intensity range</b>	Up to 8 mW/cm <sup>2</sup>

### Advantages:

- \* Easy to use
- \* An excellent system for laboratories and small productions
- \* 1 year warranty
- \* 5 years after sales service



## ► Standing Industrial Lithography System with Motorized Aligner System

◆ Samaneh Tajhiz Danesh Co.

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



### Product Introduction:

Lithography is one of the best methods to transfer the pattern from the mask to the substrate surface. Sometimes it is necessary to add or remove several layers on a substrate in the manufacture of micro or nano devices.

The lithography system with a motion module with 5 degrees of freedom of the substrate and the camera relative to the mask provides this possibility. In this system, after aligning the mask to the substrate by the module, controlled exposure is performed on the light-sensitive material.

**Founded:**

2012

### Application:

Lithography and pattern transfer on photoresist materials, creating patterns on thick layers, making microchannels, microelectronic devices, microsensors, MEMS, nanosensors, microfluidics

*This product is final B2B equipment.*

### Technical Specifications:

- \* UV light with a single wavelength of 365 nm
- \* Maximum UV light intensity 7 mW/cm<sup>2</sup> on a diameter of 10 cm
- \* Uniform light intensity with %15 accuracy on a diameter of 10 cm
- \* Parallel illumination system with high accuracy of 5 degrees at a distance of 5 cm
- \* Light exposure in two modes of fixed intensity as a percentage of Full Power or pulsed PWM
- \* Setting the time and UV intensity in the exposure system
- \* Ability to choose sub-layer with different dimensions
- \* Moving the camera in the range of 15+cm
- \* Precise positioning of the wafer relative to the mask
- \* Very smooth displacement with 0.2 micrometer resolution and 1 micron accuracy
- \* Rotation resolution of the substrate 0.018 degrees
- \* 0.36 degree rotational accuracy under the layer
- \* Showing the position of the mask and the substrate and inspecting the sample with the help of a zero backlash digital microscope along the XYZ axes.

### Advantages:

- \* Display the relative speed and position with respect to the specified location
- \* Displaying the position of the mask and the substrate and inspecting the sample using a digital microscope
- \* 1 year warranty
- \* 5 years after sales service



## ➤ UV Contact Lithography Device

◆ Samaneh Tajhiz Danesh Co.

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



### Product Introduction:

Lithography is engraving in nano dimensions, which is considered a top-down method and is widely used in electronic industries. Using lithography, certain geometric patterns are created on a substrate. To create these patterns, you can use light, electron beam, stamping techniques in nano dimensions, etc., and create the desired design with or without a mask. Lithography is widely used to produce transistors, integrated circuits and electronic components.

Contact lithography is one of the simplest and cheapest methods to transfer the pattern from the mask to the surface of the desired substrate. This method makes it possible to create designs on polymer layers and especially photoresists.

**Founded:**

2012

### Application:

- ※ Pattern transfer from glass mask to photoresist
- ※ Transferring the pattern from the talc mask onto the photoresist
- ※ Molding for PDMS or biocompatible materials
- ※ Can be used in NANO, thin film, microelectronics, MEMS, medical engineering and chemistry laboratories.

*This product is final B2B equipment.*

### Technical Specifications:

<b>Body Material</b>	Steel
<b>Entering and displaying information</b>	Using the touch screen
<b>Temperature range</b>	From ambient temperature to 150 degrees Celsius

### Advantages:

- ※ Setting the time and intensity of exposure in ten steps
- ※ Precise positioning of the glass mask on the substrate
- ※ Creating direct contact between the substrate and the mask
- ※ Anti-acid and corrosion-resistant heater
- ※ Simultaneous display of heater and exposure system information
- ※ Immune system for ultraviolet light
- ※ 1 year warranty
- ※ 5 years after sales service



*This product is final B2B equipment.*

## ➤ Pilot Lithography Laboratory

◆ Samaneh Tajhiz Danesh Co.

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



### Product Introduction:

The lithography laboratory provides the equipment and devices needed to perform the lithography process. In this way, it is possible to perform processes such as spin coating, prebake, post bake, contact lithography (Exposure), stripping, and even removal and etching.

### Application:

- ※ Wet etching
- ※ lithography of micro and nano structures
- ※ In microelectronics
- ※ In medical engineering
- ※ Semiconductor laboratory
- ※ In physics and nanotechnology

**Founded:**

2012

### Technical Specifications:

- ※ Teflon spin coater module installed on the device table (Spin Coater)
- ※ Anti-acid and washable bowl and container for washing excess material
- ※ Fully touch screen with a special pen (stylus) with the possibility of applying a speed profile consisting of 8 sections
- ※ Making the wafer and the workpiece cocenteric with high precision using the aligner
- ※ The possibility of determining the acceleration of increasing or decreasing the speed up to 450 RPM/Sec
- ※ Detergent wastewater outlet
- ※ Inlet to inject gas into the chamber and neutralize the coating chamber
- ※ UV Contact Lithography or exposure module
- ※ Full touch screen with special stylus
- ※ Hotplate system up to 150 degrees
- ※ UV lamp system with a fixed wavelength of 365 nm or 402 nm
- ※ Adjusting the light intensity of the lamps in 10 separate steps
- ※ Heating system and solution temperature control up to 60 degrees Celsius
- ※ Timer to control the heating time of the solution

### Advantages:

- ※ Cell temperature display with manual temperature control
- ※ Precise positioning of the wafer on the bottom plate of the glass or talc mask with a completely steel bottom plate.
- ※ The possibility of stopping the exposure process and changing the light intensity in the middle of the process
- ※ Storage tank module and fluid heater
- ※ Anti-acid body completely resistant to solvents
- ※ Suction from the back and top of the cells with the help of a strong fan installed on the top of the device
- ※ Top cell lid to prevent water evaporation of solutions
- ※ Displaying the rotational speed profile online on the device screen along with saving the most used programs and recalling them for use.
- ※ The possibility of controlling the process both manually and automatically up to a rotational speed of 5000 rpm
- ※ Anodized aluminum turntable for -4inch, -6inch wafer and with slide with the requests of costumers
- ※ 1 year warranty
- ※ 5 years after sales service





## ➤ Complete Lithography Laboratory

♣ Samaneh Tajhiz Danesh Co.

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



### Product Introduction:

Lithography is one of the best methods to transfer the pattern from the mask to the substrate surface. In the manufacture of micro or nano devices, it is sometimes necessary to add or remove several layers on a substrate. The lithography system with a motion module with 5 degrees of freedom of the substrate and the camera with respect to the mask provides this possibility. In this system, after aligning the mask with respect to the substrate by the module, controlled illumination is performed on the light-sensitive material.

**Founded:**

2012

### Application:

- ※ Industrial Laboratories
- ※ Research Laboratories

*This product is final B2B equipment.*

### Technical Specifications:

- ※ Combined steel and aluminum anodized body
- ※ Complete and diced wafer lithography
- ※ Entering and displaying information using a touch screen
- ※ Special lamp with uniform light intensity
- ※ Single-wavelength UV light of 375 nm or 420 nm with intensities of 1 to 5 milliwatts per square centimeter
- ※ Setting the time and UV intensity in the illumination system

### Advantages:

- ※ 1 year warranty
- ※ 5 years after sales service



### Application:

- \* Industrial Laboratories
- \* Research Laboratories

## ➤ Pilot MEMS Laboratory

◆ Samaneh Tajhiz Danesh Co.

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



### Product Introduction:

The MEMS laboratory is one of the new devices that simultaneously and in a completely safe environment provides facilities such as wafer or substrate coating as well as washing, etching and lithography. This laboratory provides its facilities within a complex in a coherent way to build systems based on several lithography steps. By installing a spin coater inside an anti-acid assembly, this set provides the possibility of spin coating, the possibility of photoresist stripping or controlled etching. Also, with the help of a lithography system with a mask aligner inside a set with a clean table, several lithography steps on one substrate are also possible.

**Founded:**

2012

*This product is final B2B equipment.*

### Technical Specifications:

- \* Spin coater with washing capability integrated in the set
- \* Save and apply the speed profile consisting of 12 sections
- \* The possibility of covering both manually and automatically, and the ability to display the speed profile online on the screen
- \* The possibility of creating rotational speed up to 5000 rpm
- \* Data entry and display on the LCD touch screen
- \* Injection of neutral gas into the chamber and the ability to work with wafers up to 6 inches
- \* Anti-acid sink for washing
- \* Suction from the back and top of the cells
- \* Heating system and solution temperature control
- \* Timer to control the heating time of the solution
- \* Providing 375 nm or 420 nm light
- \* Aligning the substrate to the new mask
- \* The ability to adjust the lighting duration
- \* Display of mask and substrate by digital microscope

### Advantages:

- \* 1 year warranty
- \* 5 years after sales service



## ➤ Microfluidic Tools Production Station

◆ Samaneh Tajhiz Danesh Co.

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



### Product Introduction:

In the production of micron tools, we need a set of equipment that can be used to perform all the processes required for production in one line. The present collection allows the user to perform all operations including sample preparation, lithography, coating, etching and bonding. This product has four sets for rotary coating, post-coating operations, limited etching, time-controlled etching, automatic system for exiting the etching solution and washing, special positive pressure rack for lithography, complete motorized lithography system with five degrees of freedom along with a digital microscope and the controlled injection system to test the manufactured assemblies.

**Founded:**

2012

***This product is final B2B equipment.***

### Technical Specifications:

- ※ Anti-acid and washable bowl and container for washing excess material
- ※ 5 inch fully touch screen
- ※ The possibility of creating a rotational speed of up to 6000 revolutions per minute
- ※ Ability to determine acceleration or deceleration from 1 to 350 Rpm/Sec
- ※ 4 degrees XYZθ displacement of the main stage of the device
- ※ Moving the stage in the range of  $10 \pm$  mm along the XYZ axis
- ※ Rotation of the sampler in the range of  $20 \pm$  degrees
- ※ Motion resolution of the substrate: 200 nm
- ※ Substrate motion accuracy of 1 micrometer
- ※ Rotation resolution of the substrate: 0.018 degrees
- ※ Substrate rotational accuracy of 0.036 degrees
- ※ The main dimensions of the device in cm: H190xW75xL124

### Advantages:

- ※ 1 year warranty
- ※ 5 years after sales service



**Application:**

- \* Micron injections
- \* Micron contacting
- \* Micron positioning and movement
- \* Fine movements under the microscope
- \* Testing of micro actuators and microchips
- \* Measurement of electrical parameters of electronic components, MEMS, NEMS and microfluidics.

➤ **4-Axis Motorized Probe Station with Digital Microscope**

◆ Samaneh Tajhiz Danesh Co.

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



**Product Introduction:**

Probe station is one of the standard tools available in industrial and academic research centers. This device is used to extract electrical characteristics of integrated circuits, micro-electromechanical systems and sensors.

This assembly positions the measurement probes in the correct position on the pads. In addition, the three-axis motorized modular table of this set is a precise positioner with a resolution of 0.2 microns, which is very efficient for other applications that require controlled 2- and 3-axis movement.

**Founded:**

2012

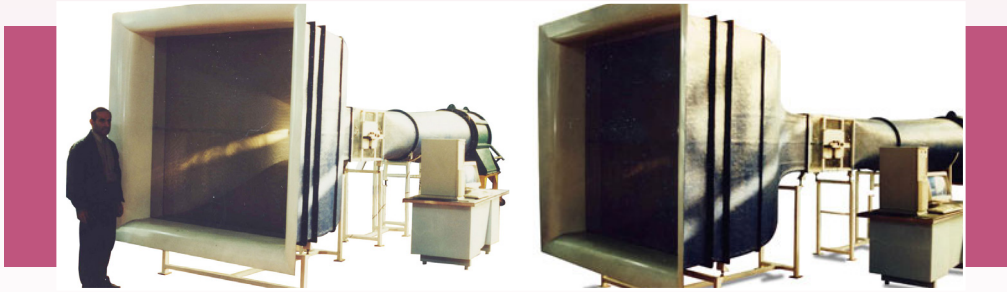
*This product is final B2B equipment.*

**Technical Specifications:**

<b>Accurate movement of probes</b>	3-axis movement
<b>Digital microscope</b>	CCD Analogue CAMERA 200X Zoom
<b>Software interface</b>	User friendly software
<b>Voltage measurement</b>	Accuracy 1 mV
<b>Voltage range</b>	±10 Volts
<b>Data acquisition</b>	Data storage and chart extraction
<b>Characterization system</b>	V-T, A-T, V-A Graphs

**Advantages:**

- \* 1 year warranty
- \* 5 years after sales service
- \* The ability to change the design based on customer needs
- \* Ability to add up to 8 probes



## ➤ Wind Tunnel Testing Device

◆ Santam Materials Testing Equipment Co.

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



### Product Introduction:

Wind Tunnel is a tool that is used in research related to the basics of gas movement and the effect of air passing over solid objects. With the help of a powerful fan, which is controlled by a driver, the air flow is passed over the object. This fan should have smooth blades to pass the air flow. We equip the object to be tested with a sensitive sensor to measure the forces produced by the air flow. Strong wind currents may create plumes around the object that can be seen as streamlines.

Air speed and pressure in the wind tunnel are measured in different ways. In the designed device, record pressure, dynamic pressure and air velocity are measured by pitot tube. By using the balance device, the aerodynamic forces of the object can be measured in the wind tunnel. Also, by using pitot tubes and as a result of the relationships between the measurement system and the relevant software, it is possible to calculate the pressure distribution at different points of the fluid and draw the curves of the angle of attack-lift, the angle of attack-drag and the angle of attack-aerodynamic torque.

### Main Export Destinations:

Germany, Italy, Russia, Oman, Lebanon

### Export History:

Up to 500,000 \$

### Founded:

1992

### Application:

- ※ Investigating the pressure distribution on the wing sections and obtaining LIFT and DRAG forces and aerodynamic torque
- ※ Investigating the effect of the shape of the airplane on: how it flights, the lift forces generated by it and air resistance
- ※ Assist in more accurate design or calculations according to simulated operating conditions
- ※ Research and development in the field of aerodynamic torques

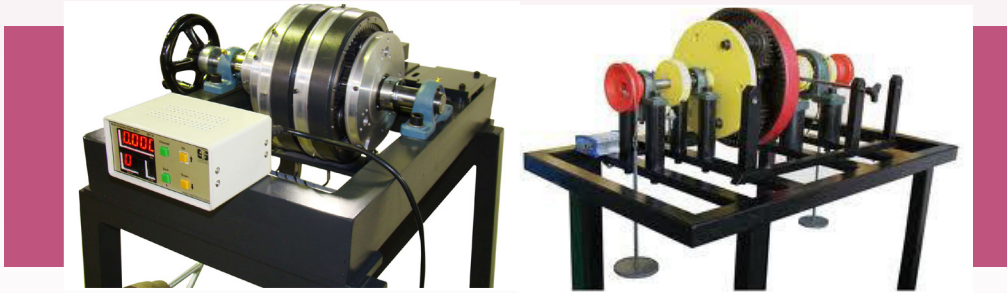
*This product is final B2B equipment.*

### Technical Specifications:

<b>Tunnel model</b>	Infrasonic laboratory tunnel
<b>Speed</b>	30 m/sec
<b>Section dimensions</b>	<ul style="list-style-type: none"> <li>※ 40 × 40 cm</li> <li>※ <b>Length:</b> 5m</li> </ul>
<b>Wind generation mechanism</b>	Fan and driver to achieve remote control
<b>Measurement sensor</b>	Load cell
<b>Electricity consumption</b>	Single-phase, 220 v, 10 A
<b>Device dimensions</b>	600 × 250 × 250 cm
<b>Weight</b>	450 kg

### Advantages:

- ※ Lower price than similar products
- ※ Very high efficiency
- ※ Open type tunnel mechanism with suction from the bottom
- ※ Control and collect data through software



## ➤ Machine Dynamics and Vibration Laboratory Device Set

### ◆ Santam Materials Testing Equipment Co.

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



#### Product Introduction:

**6-SGA simple gear device:** This device is designed to investigate and research the efficiency of simple gears and investigate the rotational dynamics of simple gears. The moment of inertia of each of the shafts and chains of the gears can also be calculated by having the applied torque and the angular acceleration of the system. Rotational speed is digitally measured using an optical optocoupler and instantaneous rotation speed display. It is also possible to test the angular acceleration of the gears, determine the overall tangent of inertia of the gears, measure the friction, and calculate the efficiency of the gears.

**Solar gear 10-SGA:** It is designed to investigate and research the efficiency of solar gears and obtain the relevant moment of inertia of the sun gear device. It is equipped with 2 models of solar gears and it is used to test the determination of the applied torque with the help of weight, and to obtain the angular acceleration, the effect of the transmission ratio, the determination of the moment of inertia, the conversion of potential energy into kinetic energy, the determination of friction and the calculation of the efficiency of the gear wheel.

**60-SGA gyroscope device:** This device is used to investigate and research the couples produced in a gyroscope and the gyroscopic reaction of the gyroscope test device. Experimental investigation of gyroscopic laws, determining the relationship between gyroscopic couple and rotor rotational speed and advanced rotational speed can be done by this device. The equipment of the device includes: display of rotation instantaneous speed in digital form, digital timer, driver with separate control capability for rotor direction and advance movement and with additional rotor to calculate rotor inertia couple and protection.

**Founded:**

1992

**Governor device 3-SGA:** Examining the characteristic curve of the governor, the difference and comparison between the actual curves and the theory of governors, the relationship between the weight of the sleeve and other characteristics of the governor, the relationship between the ratio of the arm of the governor and the stiffness coefficient of the spring and the amount of compression, and the stability and sensitivity of the governor of the governor device. Among the uses of this device are.

Kinematic testing of centrifugal governor systems (Porter governor, Proell governor, Hartnell governor) can also be done with this device. The device is equipped with a driver with the ability to control the distance and display the instantaneous speed of the distance in a digital form and is equipped with a motor and protection.

**Balancing device 3-SBA:** It is used to check and research dynamic and static balance. For this purpose, changing the angle and standard weights of the balancing test machine are used. Also, dissection and determination of unbalance test, static and dynamic unbalance check can be done with this device. This device is equipped with a driver with control capabilities and protection.

**SCF-350 centripetal acceleration device:** to investigate and investigate the laws governing the behavior of rotating masses with different circumferences, weights and radii. Various tests of the dependence of the centripetal force on the rotational speed, mass and the radius of the weights can also be performed with the help of this device. Also, the device is equipped with a driver with the capability of remote control and instantaneous display of the rotation speed in digital form and protection.

**Critical speed device for shafts 160-SWA:** Among the applications of this device, we can mention the following: checking and researching the vibration of the device shaft and recording the first and second vibration models with different conditions (including: different moments of inertia, different lengths and different support conditions, with the help of changing engine speed and stroboscope device). Testing bending oscillation and resonance in a rotating axis at different speeds, checking the critical speed of the oscillation form and self-centering phenomenon of the flexible rotor axis in simple loading, checking the oscillatory form of the first and second critical speeds in double axis loading, checking the critical speed and the behavior of the rotating disk, are some of the other applications of this device. The device is equipped with a driver capable of remote control and instantaneous digital display of the speed and frequency, stroboscope and protection.

**3-SCA cam device:** The cam test device is designed to investigate and analyze the cam and follower characteristics. The test of drawing cam displacement, speed, and acceleration curves for different profiles (curved, tangential, concave and asymmetric) can be achieved with the help of this device. Also,

the relationship between the weight of the follower and the stiffness of the spring, as well as the bounce phenomenon, can be calculated and observed. The device is equipped with a driver with digital remote control capability.

**Journal bearing device 10-SJB:** Journal bearing test device is used to investigate and research radial and axial pressure distribution in a sliding bearing. In this device, it is possible to test bearing performance through transparent tubes, pressure distribution using tubular manometers, and check the displacement of the bearing shaft at different speeds. The device is equipped with a driver with the ability to control distance and display the instantaneous speed and 10 pressure manometers with a calibrated screen.

One degree of freedom oscillation device with damper (mass, spring and damper) **SVT-10D:** To investigate and research the vibrations of the mass spring and damper system, the one degree of freedom oscillation test device with damper is designed. Testing the hardness of a cylindrical spring, the natural frequency of an oscillating mass-spring system, the effect of vibrating mass on the frequency of a mass-spring system, the effect of the damping coefficient in a mass-spring system can also be done with this device. Also, from the graph of the value of  $K$  (spring stiffness) and  $C$  (damping coefficient), the experimental periodicity obtained from it can be compared with the theoretical value. The device is equipped with viscous vibration damper, mechanical register, low friction and mechanical stability.

Free and forced oscillation device with one degree of freedom damper **SVT-10B:** It is designed to investigate, research and obtain the value of natural frequency, damping coefficient of the system as well as the resonance frequency of the free and forced oscillation device with damper. The device is equipped with a frame and viscose system in two modes of low and high damping.

**Torsional vibration machine SVT-300:** The torsional vibration machine is designed to investigate and research the factors affecting the torsional oscillatory behavior. The things investigated by this device are: testing the influence of the rotating disk, torsional oscillation and obtaining the damping coefficient, determining the natural frequency of torsional vibrations, the experimental moment of inertia of the rotating disk, the amount of  $C_t$  of the torsional damping coefficient with different height in the oil. It can also be used to determine the moment of inertia of the device using the free fall method based on kinematic relationships. The device is equipped with mechanical stability along with a pen with high precision and efficiency.

*These products are final B2B equipment.*

**Advantages:**

- \* Lower price than similar products
- \* Very high efficiency
- \* Special mechanical design for each device

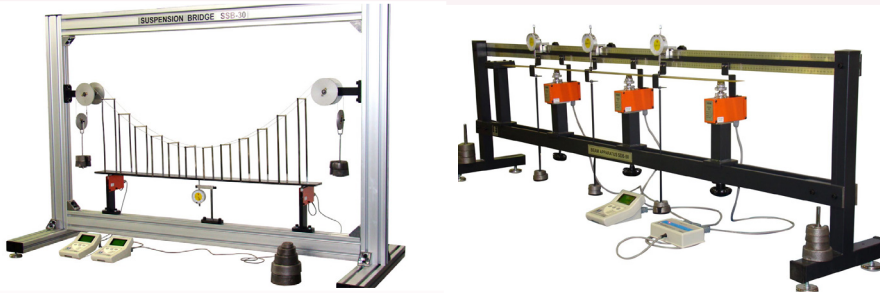
**Main Export Destinations:**

Germany, Italy, Russia, Oman, Lebanon

**Export History:**

Up to 500,000 \$





## ➤ The Set of Materials Strength Laboratory Tests

### ◆ Santam Materials Testing Equipment Co.

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



#### Product Introduction:

**STM-250 tensile test machine:** Tensile test is one of the most important destructive tests in material science. This test is used to check the mechanical properties of a material. In it, a sample is loaded under the effect of uniaxial tension until failure. Normally, the test results are used to select a material for quality control and to predict how a material will react under other types of forces. The properties that can be obtained through the tensile test are: tensile strength, the greatest increase in length and the least decrease in the cross-sectional area of the sample. Also, in this way, various engineering parameters can be determined: ultimate limit, elastic limit, rupture limit, Young's modulus, Poisson's ratio. The introduced device is a servo-electric tension test model, which is one of the most accurate tension types in the world. Considering the mechanical characteristics of the device, its software and hardware capabilities and the variety of installation of side attachments (various jaws and fixtures, various extensometers and hot chambers), many research and research works can be done with its help.

**Impact testing device SIT-200B:** failure behavior against momentary loads is often different from tensile test results. SIT-200B impact testing device is for determining the impact resistance of materials by the Charpy method. It has a capacity of 200 J. With the help of this device, it is possible to obtain the fracture energy, the limit of softness and brittleness, as well as the transition temperature for the sample of standard tests with different materials and temperatures. The design of the device is in accordance with the standard (ASTM E23). This device is equipped with a digital display with the ability to test 12 parameters of a shock test.

**Armature bending test device SGB-200:** This device is designed

**Founded:**

1992

to check the bending test of metals (Guided Bend). Bending of metals with different sections such as (Armature, rebar, sheet, welding samples, etc.) must be done according to different standards. The diversity in the construction of the test sample and the implementation of the test conditions (the distance between the supports and the diameter of the supports and the degree of bending) has caused a universal device to be designed in this regard.

Bending tests of metals are mostly based on the method of examining the appearance of cracks and fractures, therefore the bending force is not a criterion and only the bending angle or the bending depth should be observed.

**8-STC thin wall cylinder machine:** This machine is used to research and check surface tension and strain of cylinders under pressure at different angles. In this device, 6 strain gauges are installed on the surface of the cylinder to check the tangential and longitudinal stresses of the cylinder. This device has the ability to test both closed and open curvature conditions along with a digital strain gauge to read each of the strains.

**STC-12 thick wall cylinder test device:** This device is for researching and checking the stress and strain of thick wall cylinders under an internal pressure and measuring the asymmetric distribution of stresses on the walls of the cylinders. The distribution of stresses in a thick-walled cylinder is three-dimensional, which includes radial, circumferential and axial stress. Applying pressure by the oil inside the cylinder is done manually and its display is done through the gauge and strain gauge installed on the inner surface of the cylinder. Installing 13 strain gauges in different directions allows the stress and strains in the inner wall of the cylinder to be investigated. This device is equipped with a SIT-50 digital display to display the amount of chemicals in 13 different channels.

**20-SST stress and strain device:** To learn how strain gauges work based on Wheatstone bridge law, you can use the 20-SST stress and strain device. Three types of beams in the form of flat (bending test), round (twisting test) and flat sample (tensile test) have been installed on the device so that the amount of strain in different beams can be seen through the strain gauge by the indicator display.

**8-STA truss testing machine:** 8-STA truss testing machine is used to investigate and check the forces applied on each member of the truss. This device is equipped with 8 steel joints. Truss and joints are designed in two static states, sliding support and joint support. The strain gauge is separately equipped with a digital display to check the strain on the members. This device is equipped with a special switcher for measuring strains.

**SFT-600 Fatigue Testing Machine:** Fatigue causes the material to break under a stress lower than the predicted value in the static test. The SFT-600 fatigue testing machine is used to observe this phenomenon and also to test parts and materials that are subjected to alternating loads.



The test sample in the form of cantilever bars is subjected to bending moment and the number of alternating cycles is counted by a digital cycle counter. The device has an automatic cut-off system that, as soon as the test sample breaks, the engine and counter are turned off and the number of stress cycles is recorded. With the help of this device, it is possible to obtain the stress curve of number of turns (S-N) and Endurance Limit for the sample.

**SFT-850 Fatigue Tester:** The SFT-850 rotary fatigue test machine is a fully research and industrial device, which is designed for high-speed and high-cycle tests according to ISO 1143 and DIN 50113 standards. Fatigue 850 is designed as 4 supports and has a very precise mechanism. The fracture of this device occurs in the middle of the test sample. A maximum load of 400 Ns and a maximum bending moment of  $M=20$  Nm can be applied to the piece. This device is equipped with very efficient jaws with different collets to grip different sizes of test samples.

**50-STS Plastic Torsion Testing Machine:** Shafts of industrial machines and mechanical devices are mostly under shear stress. The 50-STS plastic twist test device is used to determine the shear strength of different materials up to 50N.m capacity on standard test samples. The applied torque can be measured by a digital torque meter and the amount of twisting angle can be measured by means of conveyors connected to the reducer gearbox (in two directions). With the help of the above device, the yield shear stress of the shear model (6), the residual strain and the T-Q diagram can be obtained until the sample breaks.

**5-STA elastic torsion test:** The 5-STA elastic torsion test device examines the relationship between the effective parameters in the torsion of rods (torsional torque, shear modulus, torsion angle, moment of inertia and rod length). Special test samples with different diameters and materials are installed on the device and with the help of weights, twisting torque is applied to the test sample. The twist angle value is measured by two protractors that can move along the length of the test sample.

**Bending test of symmetric beams SDB-50:** relationships governing beams are very important in the design of bridges, buildings, airplanes, etc. The effective parameters in beam bending (length, moment of inertia, modulus of elasticity) as well as deflection, radius of curvature and supporting force can be observed and researched by SDB-50 symmetric beam testing machine. Force hangers, beam risers, and movable supports on the rail measure the device. The blade supports measure the force with the help of the electronic system connected to them, and the clamp support provides the end conditions for the cantilever.

**Buckling test of SDB-20 asymmetric beams:** torsion of asymmetric sections of cantilever beams can be researched and investigated by SDB-20 asymmetric beam buckling test device. Three types of beams with stud, corner and rectangular sections are easily installed on the device and the force can be applied in different directions from its free end. With the help of this device, it is possible to obtain the rise, twist angle and cutting center of the rudder at different angles with high accuracy.

**SDB-30 bending beam creep test:** Changing the location of bent beams and

investigating Castigliano's first theorem can be checked by the SDB-30 bending beam creep test device. This device consists of three types of circular, semi-circular and quarter-circular curved beams, as well as measuring clocks and special hooks for applying force. Two of the measuring clocks can be replaced with the help of a hand screw and installed on the above three types of curved beams.

**30-SDF frames:** In order to check the bending in the frames and to check the elastic limit, the frame bending test device is designed. It is possible to test in different types of frames with different shapes and check the amount of force and movement of the frame. The measurement of displacement and spring of the frame is done using the magnet base and the indicator clock installed on the device.

**Buckling test SBA-140:** If the length of the beam is too large compared to its cross-sectional area (moment of inertia of the beam), it is important to change the vertical form of those beams in the design for compressive forces. The SBA-140 buckling test device is for observing the buckling phenomenon and also obtaining the critical force for long beams. The test sample with length, moment of inertia and different materials as well as different end conditions is mounted on the device and with the help of the force plate, the superior compressive force is applied. The change of the vertical position is measured by a clock and the amount of critical force is measured by a digital force gauge with high accuracy.

**25-SCT creep test device:** Changing the shape of materials under the influence of constant stress over time is called (creep). This phenomenon is investigated in metals and engineering materials, which occur at high breaking temperatures at stresses much lower than their yield stress. Three stages of creep can be displayed and measured by the 25-SCT creep test device for rubber and plastic samples at normal temperatures up to 25 Kg capacity.

**16-SDL-16-channel signal conditioner and data logger device:** Data logger is an electronic device that collects data measured by sensors over time. The multi-purpose data logger is for recording analog sensors. The designed device can collect sensor data with high accuracy and low noise and transfer it to the software. The 16-SDL data logger includes internal and conditioner interfaces, which, in addition to amplifying the signals by dip switches, can change the value of Gain and Zero for 16 channels and finally send quality signals to the software.

**50-STI power display:** To display force, torque, pressure, strain gauge, length change, etc., which have a resistance bridge structure, you can use the 50-STI digital transducer display. This device amplifies the electronic signals sensed by full-bridge and resistance transducers and displays them digitally with the desired volume unit.

Impact testing machine SIT200-B	
Test method	Charpy
Pendulum	200 J Charpy
Release angle	150 degrees
Electricity consumption	Single phase, 220 V, 2A
Dimensions	220 × 82 × 215 cm
Weight	330 kg
Armature bending test machine -200SGB	
Stroke Jack	300 mm
Diameter of fixed supports	38, 50, 100 mm
Adjustable distance between fixed supports	50 - 450 mm
Accuracy of adjusting the distance between the supports	1 mm
Operating temperature	10 to 38 degrees Celsius, 10 to 90% humidity, non-condensing
Electricity consumption	220 ± 10 V, 16 A
Dimensions	60 x 50 x 208 cm
Weight	320 Kg
Fatigue testing machine SFT600-	
Round measure	Digital counter with a capacity of 10 million rounds
High speed test	6000 rpm
Loading mechanism	Applying force by weight to the sample in a single head position
Type of jaws	Clamps with a diameter of 9 mm
Electricity consumption	Single phase, 220 volts, 5 amps
Dimensions	72 × 32 × 25 cm
Weight	55 kg
Impact testing machine SIT200-B	
Maximum bending stress	850 MPa
Measuring cycles	by a digital counter with a capacity of 10 rounds
Rotation speed range	200-6000 rpm
Sensor	Optocoupler for distance measurement by counter
Type of jaws	Clamp

Calibration	Calibration of force (load cell), strain (strain gauge) and temperature
The temperature of the operating environment	10-38 °C
humidity	10 to 90% non-condensing
Electricity consumption	Single-phase, 220 v , 5 A
Device dimension	72 × 25 × 32 cm
Weight	170 kg
SDL16 - 16- channel signal conditioner and datalogger	
Number of channels	16
Interfaces	External and Internal
Number of samples per second	100 samples per second
Number of filters	Four ranges for each channel
Measurement accuracy	0.005%
Electricity consumption	One-way, 220 volts, 1 amp
Box dimensions	Cm 105 × 223 × 43
Weight	3.2 Kg
Power indicator STI50-	
Reading	LCD Dot Matrix display with data output as 232-RS
Titles that can be displayed	Force, Exten, Pressure, Stress, Weight, R.0, Torque, Strain
Displayable units	N.m, kN, N, mm,m, m, %, mv/v, MS, Bar, Pa, Kpa, Mpa, Kgf, Kg, g
The number of inputs that can be connected and displayed	8 channels
Dimensions	30 x 70 x 160 mm
Weight	200g
Electricity consumption	9 volts, 0.5 amps
Operating temperature	Up to 38 degrees Celsius, 10 to 90% humidity, without condensation

#### International Standards or Permissions:

- \* **Impact testing device SIT-200B:** ASTM-E 23, ISO148, EN 10045-2
- \* **Armature bending test device SGB-200:** ISIRI 3132 and ISIRI 1016 and ASTM E 290, E 190 and DIN, ISO 9809
- \* **Fatigue testing machine SFT-600:** ISO 1143
- \* **Fatigue testing machine SFT-850:** ISO 1143, DIN 50113

**These products are final B2B equipment.**



## ➤ Bending and Rebending Testing Device

◆ Santam Materials Testing Equipment Co.

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



### Product Introduction:

Bend & Re-bend test is used to determine the quality of metals or welding against plastic deformation. The bending and re-bending device is most used in armature testing. The most important characteristics of an armature are ductility, cross-sectional area, resistance to yield strength and rupture, and weldability. The bending and re-bending test is performed according to the conditions defined in the standard for different rebar diameters and bending and re-bending angles, and finally after the test, cracks or peeling are checked (visually).

### Main Export Destinations:

Germany, Italy, Russia, Oman, Lebanon

### Export History:

Up to 500,000 \$

### Founded:

1992

### Application:

Bending and re-bending test of rebars and steel belts

*This product is final B2B equipment.*

### Technical Specifications:

<b>Model</b>	SBR-200B
<b>Function</b>	Mechanical servo (servo motor and driver and solar gearbox)
<b>Maximum capacity</b>	5200 N.m equivalent to 20 Ton
<b>User interface</b>	By HMI touch screen
<b>Control system</b>	PLC type control system with the ability to adjust test method parameters
<b>Bend angle range</b>	0 -180 °
<b>Angle adjustment accuracy</b>	0.1 °
<b>Operating temperature</b>	10 to 50 degrees Celsius, 10 to 90% humidity, non-condensing
<b>Electricity consumption</b>	380 ± 20 V, 25 A, three-phase
<b>Dimensions</b>	113 x 70 x 120 cm
<b>Weight (approximate)</b>	650 Kg

### Advantages:

- \* Equipped with an industrial wheel and a special screw for installation on the ground
- \* Equipped with visual display of errors and warnings
- \* Equipped with a flash memory output for extracting test data including force, angular velocity, and torque in Excel format
- \* High safety during testing
- \* Lower price than similar products
- \* Very high efficiency

### International Standards or Permissions:

- \* ASTM-A615
- \* ISIR 3132

**Application:**

Determining the fatigue limit of metals

**Rotary Fatigue Testing Device**

◆ Santam Materials Testing Equipment Co.

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

**Product Introduction:**

The rotary fatigue device is used to determine the life of parts and to obtain the cycle relationship of load application over time. This device is widely used in the industry. In the design of this device, the parameters of wear, heat, corrosion, crack resistance, structure strength, value and friction are important parameters, and bearings with high rotation and durability are used. Also, it is designed to work for at least 10 million cycles and is equipped with suitable jaws to grip all kinds of diameters and resistant to loosening during work.

**Main Export Destinations:**

Germany, Italy, Russia, Oman, Lebanon

**Export History:**

Up to 500,000 \$

**Founded:**

1992

*This product is final B2B equipment.*

**Technical Specifications:**

<b>Rotation measurement</b>	Digital counter with a capacity of 10 million rounds
<b>High speed test</b>	6000 rpm
<b>Loading mechanism</b>	Applying force by weight to the sample in a single head position
<b>Type of jaws</b>	A clamp with a diameter of 9 mm
<b>Electricity consumption</b>	Single phase, 220 volts, 5 amps
<b>Dimensions</b>	72 × 32 × 25 cm
<b>Weight</b>	55 kg

**Advantages:**

- \* Fatigue test by applying reverse bending stress
- \* Automatic stopping of the device after sample failure
- \* Precise loading mechanism
- \* Lower price than similar products
- \* Very high efficiency



### Application:

Research on gasoline engine

## ➤ Gasoline or Diesel Engine Testing Device

◆ Santam Materials Testing Equipment Co.

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



### Product Introduction:

This device includes a gasoline or diesel engine, whose intake air flow rate is measured by an orifice and a manometer. It is also possible to calculate the consumption fuel flow rate. The output power of the engine is transferred to the generator under the name of braking power and is consumed when the heaters are turned on. The engine speed is displayed on the panel in terms of rpm. The exhaust gases are cooled by a non-aligned heat exchanger.

Using this device, it is possible to calculate specific fuel consumption, volumetric efficiency, fuel efficiency and heat transferred from exhaust gases in non-aligned heat exchanger.

### Main Export Destinations:

Germany, Italy, Russia, Oman, Lebanon

### Export History:

Up to 500,000 \$

### Founded:

1992

*This product is final B2B equipment.*

### Technical Specifications:

- \* Measuring the ratio of air to fuel consumption
- \* Observing engine speed
- \* Measuring the temperature of the water entering and exiting of the converter
- \* Measuring the temperature of smoke entering and exiting of the converter



### Application:

Determining the proper static and kinetic friction coefficients for film samples and various materials

## ➤ Vacuum Testing Device (Sealing)

◆ Santam Materials Testing Equipment Co.

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



### Product Introduction:

In many parts, sealing between parts is of particular importance. By creating a vacuum in the test chamber in a fully automatic and controlled manner, SVT-500 provides the possibility of testing the sealing and leakage of the relevant parts.

### Main Export Destinations:

Germany, Italy, Russia, Oman, Lebanon

### Export History:

Up to 500,000 \$

### Founded:

1992

*This product is final B2B equipment.*

### Technical Specifications:

- \* Fully automatic operation and three processes of vacuum application, vacuum maintenance and vacuum release for the test chamber
- \* Transparent test chamber with digital vacuum display equipment with a resolution of 1 mmHg
- \* Setting the test chamber vacuum value maintenance time digitally and pre-set (from 1 second and higher than that)
- \* Vacuum storage tank with digital vacuum display equipment with a resolution of 1 mmHg
- \* Maintaining and controlling the vacuum value of the test chamber with **adjustable tolerance:  $\pm 5$  mmHg**
- \* **Sealing mechanism:** special rubber (without grease) with high test capability
- \* Digital recording of vacuum application and vacuum release times (in seconds)
- \* **Device capacity:** 5 vacuum

### Advantages:

The ability to adjust the speed of applying and releasing the vacuum with the help of manual valves



## ➤ Coefficient of Friction TESTING Device (Cof)

◆ Sanaf Co.

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

**Sanaf**  
Precision Electronics

### Product Introduction:

This device is used to measure the coefficients of initial friction and sliding friction of plastic film and sheet, paper, leather, wood, etc. when sliding on itself or other objects.

The friction coefficient device consists of a moving slider and a fixed plate. Thus, it measures the coefficient of static friction and the coefficient of kinetic friction of plastic films and coatings through sliding when they slide on themselves or other materials. This is done according to the standards of the device.

### Main Export Destinations:

Turkey, Azerbaijan, Uzbekistan, Turkmenistan and Oman

### Export History:

Up to 500,000 \$

### Founded:

2002

### Application:

Determining the appropriate static and kinetic friction coefficients for film samples and different materials

*This product is final B2B equipment.*

### Technical Specifications:

<b>Power resolution</b>	0.0001N
<b>Ability to adjust the speed</b>	up to 500 mm/min
<b>Capabilities</b>	<ul style="list-style-type: none"> <li>* Adjusting the speed and course of the test movement</li> <li>* Saving the results in pdf and program format</li> <li>* Opening previous test files and viewing their results</li> <li>* Direct printing of results</li> <li>* Manual operation to move the sled</li> </ul>

### Advantages:

- \* Ease of use and maintenance
- \* Ability to test a wide range of materials
- \* High accuracy and repeatability
- \* Modular design

### International Standards or Permissions:

- \* Has a load cell calibration certificate (approved by the Standard Department)
- \* According to ASTM1894 standard



➤ **Measuring stable or unstable two-phase relative permeability**  
 Liquid-liquid and Liquid-gas at High Temperature and Pressure and Automatic Data Collection

◆ Petro Ahoura Co.

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



**Product Introduction:**

One of the characteristics of a porous medium is permeability, and it is, in fact, the ability to pass fluid. To measure the permeability of a porous medium, one can determine the amount of fluid conductivity in that medium. Similar to electrical and thermal conductivity, permeability also refers to fluid flow conduction. Permeability is the same at all points and all directions of a homogeneous and isotropic environment. However, we will rarely see homogeneity and isotropy in real rock samples.

The device measures the permeability of the liquid equivalent of the rock sample using gas in an unstable state. Using a tank with a specified and calibrated volume, nitrogen gas or helium is discharged into a rock sample that is under high pressure conditions. The data derived from pressure is recorded in terms of time and by analyzing these data and calculating the output flow rate from the target tank, the permeability of the rock sample is measured.

**Main Export Destinations:**

Oman

**Export History:**

Up to 500,000 \$

**Founded:**

2012

**Application:**

Measurement of rock permeability in stable and unstable states

*This product is final B2B equipment.*

**Technical Specifications:**

pressure range	above 400 bar
Core holder	above 400 bar
wetted material	Stainless steel
Transfer vessel volume	500 cc
Core diameter	1.5 inches
Core length	As requested

**Advantages:**

High accuracy and speed in measurement





- **Fluid injection device with parallel water flooding capability at a temperature and pressure of at least 700 bar with automatic data collection**

◆ Ezdiad Bardasht Fars Co.

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



**Product Introduction:**

This device can be used to investigate the effect of the acidification process with acids such as HCL, HF and other acids (and even a combination of these acids) on the change in permeability of reservoir rock. Although this device is specifically designed and built for acidizing, it can also be used as a device for simulating secondary and tertiary Enhanced Oil Recovery (EOR) processes. Due to the use of titanium fittings and raw materials, this device has a much longer useful life than similar devices made of stainless steel. The device is produced in two research versions.

**Main Export Destinations:**

Malaysia

**Export History:**

Up to 500,000 \$

**Founded:**

2010

**Application:**

Drilling and exploitation of oil industries

*This product is final B2B equipment.*

**Technical Specifications:**

Core diameter	1.5 inches
Maximum core length	6 inches
Maximum operating pressure	700 bar
Maximum confining pressure	700 bar
Pressure transmitter accuracy	0.1% of the total range
Temperature application system	Thermal jacket

**Advantages:**

High product quality and much more reasonable price than other samples



**Application:**

To make hard tissues such as bone tissue with dimensions higher than one centimeter with the desired shape and in a uniform manner

➤ **Bone Tissue Engineering Bioreactor**

◆ **Biotech Vision Fater Co.**

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



**Product Introduction:**

Increasing life expectancy have caused bone diseases, including bone infections, fractures, osteoarthritis, osteoporosis, rheumatoid arthritis, and spinal disorders, which require surgical interventions, become a major economic and social challenge. Usually, the use of autologous BONE GRAFTs is associated with potential complications. Therefore, alternative strategies are needed for skeletal reconstruction. For this purpose, tissue engineering is used to develop functional substitutes for damaged tissues.

Tissue engineering has 3 main components of cells, growth factors and SCAFFOLD. During cell culture, the use of physiological stimuli, biochemical stimuli and mechanical signals help and speed up cell differentiation and ECM production. Tissue regeneration can be done either completely inside the body or with the help of an IN VITRO phase. In the second case, a BIOREACTOR can be used as a device to mimic physiological and mechanical conditions.

By examining the types of bioreactors and taking into account the advantages and disadvantages of each and considering that the bone tissue is under pressure in a physiological state, it can be concluded that the best mechanical stimulus is pressure. In this way, we are bound to use only bioreactors that, in addition to CELL SEEDING and ROTATING, also have the ability to apply pressure. This bioreactor has the ability to control the pressure and tension inside the tissue being produced in addition to the ability to adjust the dimensions for structures with a specific shape.

**Founded:**

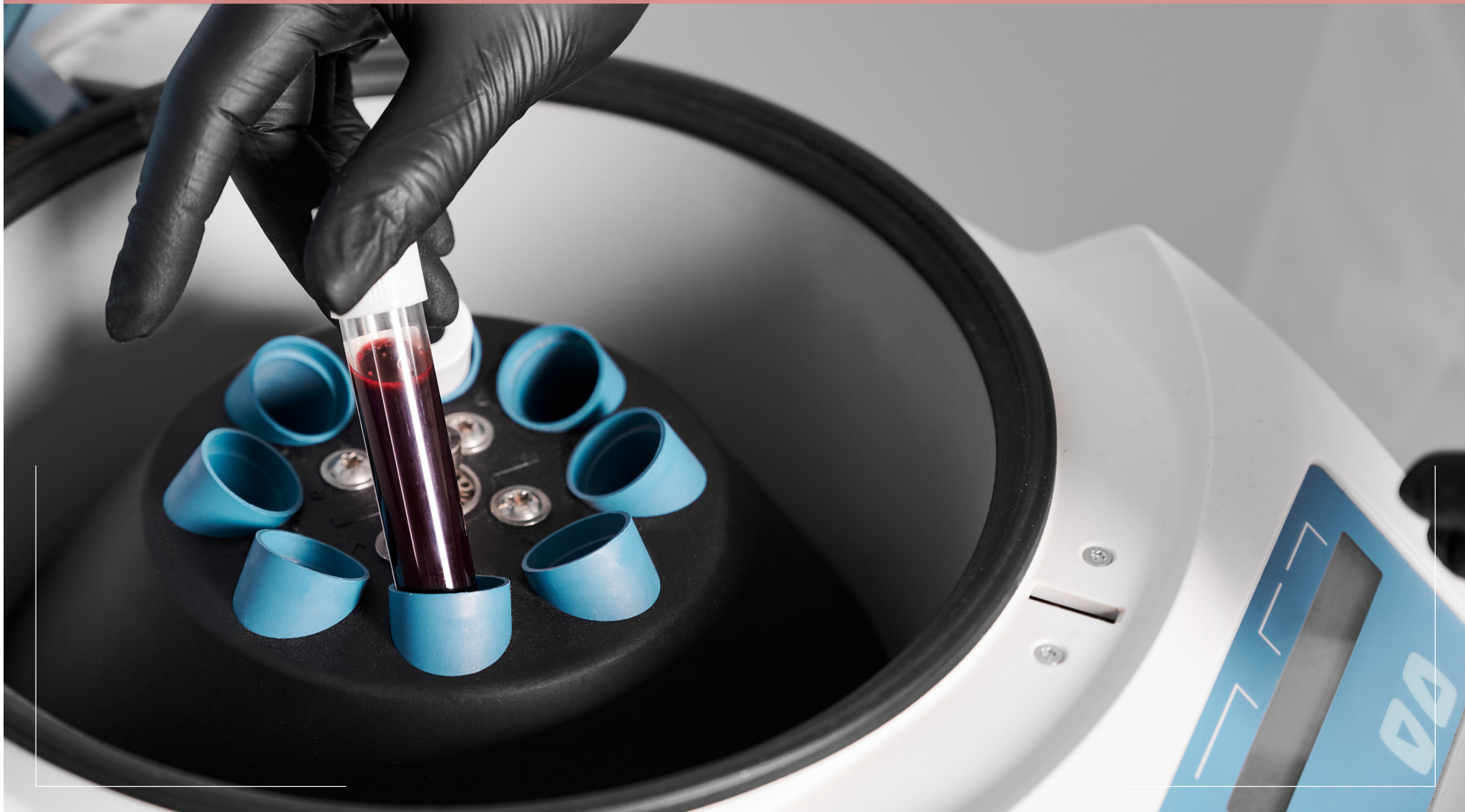
2015

*This product is final B2B equipment.*

**Technical Specifications:**

<b>Operating temperature</b>	37 °C
<b>Bioreactor size</b>	Variable according to the required tissue size
<b>Stirrer</b>	Magnetic

Second Chapter  
Advanced General Laboratory  
Equipment



# 2<sup>nd</sup> CHAPTER

First chapter

Second CHAPTER

## Advanced General Laboratory Equipment

High speed centrifuges (up to 15000 rpm and more)	174
Environmental tests lab for airborne equipment including	176
Heat and humidity test chamber device	178
-86°C Deep freezers	180
-80°C Deep freezers	182
-80°C Deep freezers	184
High pressure Syringe pump	186
Advanced Three Independent Syringe Pump	188

Sections

Centrifuges ○

Chambers for Controlling Environmental Conditions and Precise Glove Boxes ○

Laboratory Freezers ○

Precise Peristaltic and Syringe Pumps ○



## ➤ High Speed Centrifuges

Up to 15000 rpm and more

◆ Farzaneh Arman Co.

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



### Product Introduction:

The centrifuge, which is one of the important laboratory tools, is used to separate materials or combinations of materials with a maximum density of 1.2. As the sample rotates in the centrifuge, the centrifugal force is applied to the different parts of the material. Therefore, because of the different specific weights of the sample components, the heavier compounds are placed at the bottom and the lighter compounds are placed at the higher level of the container.

The engine of HS 18500 model high-speed digital centrifuge and HS 18500 R high-speed refrigerator digital centrifuge are of the brushless type, which are among the high-speed motors of the new generation and have long operational time.

### Main Export Destinations:

Iraq

### Export History:

Up to 500,000 \$

### Founded:

2013

### Application:

Separation of different combinations of samples in various clinical, blood, chemical, engineering, research, etc. tests.

*This product is final B2B equipment.*

### Technical Specifications:

Maximum speed	18500 r/min
Maximum RCF	23797g
Maximum capacity	6 × 50 ml
Engine	AC frequency conversion motor
Maximum power consumption	※ HS 18500 model: 450w ※ Model HS 18500 R: 1200w
Speed accuracy	±50 r/min
Time setting range	※ Short-run - Press (PULSE) ※ Timing: 10 sec - 99 min59 sec Continuous - HOLD
Temperature	10 °C to 35 °C
Power supply (single phase, three wires)	220×(1±10%)VAC 50Hz 5A
Dimensions of the centrifuge (L×D×H)	※ HS 18500 model: 360 × 420 × 520 (mm) ※ HS 18500 R model: 360 × 420 × 670 (mm)
Net/gross weight	※ HS 18500 model: 60/50kg (mm) ※ HS 18500 R model: 120/90kg (mm)

### Advantages:

- ※ Unique centrifuge power
- ※ Maximum RCF acceleration equal to 23800g
- ※ Equipped with an automatic rotor detection system
- ※ Ability to install 7 different types of rotors
- ※ Ability to use different microtube containers, 15 ml tube, 50 ml Falcon, etc
- ※ Long life of the motor by using High Frequency technology and inverter
- ※ High safety with a 3-walled steel body
- ※ Silent and vibration-free operation
- ※ Non-Freon gas cooling system with the ability to adjust the temperature up to 10- °C, equipped with an electric engine brake system with the ability to adjust the intensity of the brake.
- ※ Equipped with warning system for unbalanced loading of samples, door safety sensor, etc



- **Environmental Tests Lab for Airborne Equipment Including** High Temperature, Low Temperature, Hydraulic, Electrical, Vacuum, Salt Fog ,and Fungus Testing Machine.

- ◆ **Ebtekar Sanat Sharif Co.**



**Product Introduction:**

In order to examine the accuracy and functions of the manufactured components in various industries, the authoritative international associations have established uniform standard processes which require the industries to meet these standards. This becomes even more noticeable in the highly sensitive industries. Amongst them, aircraft manufacturing industry is of highest sensitivity and many of the standards developed in other industries have been obtained from the results in this industry. As an integral components of the aircraft, tire requires its own specific test standards. The tests devised for tires are of various types and include fiber adhesion test, static loading test, dynamic tests, high tire pressure test (tire bending test), dimensional tests and so forth.

**Application:**

Conducting all dynamic tests of air systems

*These products are final B2B equipment.*

**Founded:**  
2009



Knowledge-based products and equipment



**Application:**

All laboratories that require stable conditions of temperature and humidity

➤ **Heat and Humidity Test Chamber Device**

◆ Grouc Co.

www.grouc.com



**Product Introduction:**

The temperature chamber provides a controlled environment that can simulate the conditions a product will encounter during use. These highly controlled technical tools are capable of creating a variety of use-case and atmospheric hazards that a product may experience. To determine the lifespan of a product, temperature chambers can create conditions that simulate the lifespan of a product by rapidly aging it. Temperature chambers give companies the opportunity to test how the product reacts under adverse conditions. The ability to do and create these situations can prevent the introduction of a product to the market that is not able to meet the customer's expectations.

**Founded:**

1994

*This product is final B2B equipment.*

**Technical Specifications:**

<b>Temperature range</b>	15 to 95 °C
<b>Humidity range</b>	30 to 99 percent
<b>Designable and constructable volume</b>	100 liters to 500 cubic meters
<b>Inner and outer body material</b>	Steel
<b>Temperature fluctuation</b>	At stable state 0.2 °C

**Advantages:**

1 year warranty and 10 years after-sales service

**International Standards or Permissions:**

Patent certificate of the processing chamber of standard concrete test samples in laboratories

*This product is final B2B equipment.*



## ➤ -86°C Deep Freezers

◆ Danesh Pajooresh Fajr Co.

[www.dpf-bloodbank.com](http://www.dpf-bloodbank.com)



### Product Introduction:

Deep freezers are testing equipment that can lower their internal temperature to freezing or even below freezing point. Depending on the type of test, the amount of cold can be produced from 0°C to -273°C. Usually in industry or medicine, freezers with -20°C to -80°C are the most widely used ones. The way this testing equipment work is that, for example, in the industry, the required component is placed inside it and its temperature is adjusted, and then at the desired temperature, the resistance of the component against impact, movement, abrasion, etc. is measured.

### Application:

This product can be put into use in genetic, biological, biotechnology research institutes, laboratories of medical, agricultural, food, pharmaceutical industries, related factories, etc. and can be produced in different sizes and capacities.

**Founded:**

2000

### Technical Specifications:

temperature range	-50 to -80°C
temperature tolerance within the shelves	±2°C
Accuracy of data logger display (stability) and controller	0.1°C
Inner body material	Matte stainless steel
Outer body material	Galvanized sheet with electrostatic coating
volume	415 lit
Consumption power	3100VA
External dimensions of the device	* Length: 102.5 * Depth: 90 * Height: 198
Internal dimensions of the refrigerator	* Length: 73.5 * Depth: 60.5 * Height: 94

### Advantages:

- \* The product is equipped with two separate temperature control systems and each system includes two European-made thermostats
- \* It is equipped with a temperature data logger (stability) along with a PT100 sensor to permanently store the temperature, date and time every 5 minutes.
- \* Ability to install the SMS CENTER device to send alarm messages

### International Standards or Permissions:

- \* ISO 9001
- \* ISO 13485
- \* CE certificate





*This product is final B2B equipment.*

## ➤ -80°C Deep Freezers

◆ Faratjehiz Arman Pajooch Co.

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



### Product Introduction:

Laboratory freezers or laboratory deep freezers are one of the important equipment in the laboratory industry. The main task of this device is to create a suitable temperature for testing, maintaining and planting products. Deep freezers are often similar to home freezers. It differs in a series of updated features: such as automatic defrosting and programmable alarms for research applications. Deep freezer interiors are custom made for shelves and storage compartments for samples.

The present deep freezers are available in standing models (130, 350, 150 and 500 liters) and box models (50, 200, 300, 400, 500, 600 liters).

### Application:

- \* Research centers
- \* Medical laboratories
- \* Biotechnology, biological, pharmaceutical
- \* Chemical industry
- \* Petrochemical
- \* Oil and Gas
- \* Standard and calibration laboratories
- \* Quality control and quality assurance laboratories for drug storage
- \* Laboratory kits
- \* Biological products and samples
- \* Laboratory solutions and materials

**Founded:**

2013

### Technical Specifications:

<b>Adjustable temperature range</b>	0-80 °C
<b>Outer body material</b>	Galvanized with electrostatic paint coating
<b>Inner body material</b>	Stainless steel
<b>Cooling system</b>	High power and low noise European compressors
<b>Input power supply</b>	1 PH/220 V AC/50 Hz

### Advantages:

- \* Lockable wheels
- \* The possibility of ordering stainless steel racks and baskets according to the customer's needs
- \* With stainless steel dividers
- \* Isothermally of different parts of the deep freezer
- \* Intelligent alarm and troubleshooting system
- \* The ability to draw and maintain device temperature graphs for a long time
- \* It has a smart digital temperature control system with 0.1 degree adjustment accuracy
- \* It has a temperature recording system with the ability to record information through a USB port on a flash memory
- \* It has a temperature monitoring system and unauthorized status reporting and warning by SMS and phone call
- \* Has a 4-inch industrial color touch screen (HMI) with easy to use in two languages
- \* Capable of recording and displaying alarms, table and graph of system sensors on the screen
- \* 1 year warranty and 10 years after sales service



### Application:

Various industrial, medical, agricultural, military, etc. laboratories

## ➤ - 80 °C Deep Freeze

◆ Grouc Co.

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



### Product Introduction:

Deep freezers are devices that can lower their internal temperature to the freezing temperature and even below freezing. Depending on the type of test, the amount of cold created in them can be produced from 0 °C to -273 °C. The present product is a freezer device for -86 °C, which the researcher can keep the samples at this temperature.

**Founded:**

1994

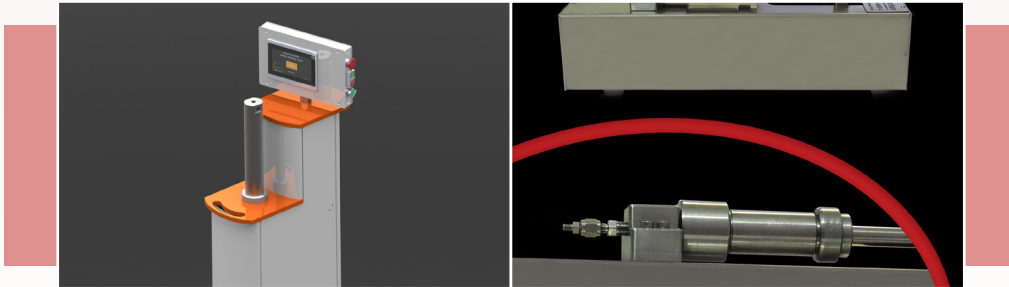
*This product is final B2B equipment.*

### Technical Specifications:

<b>Temperature range</b>	Environment temperature up to -86 °C
<b>Device volume</b>	100 to 3000 liters
<b>Display accuracy</b>	<ul style="list-style-type: none"> <li>* 1 degree</li> <li>* <b>Made in two forms:</b> single-phase and three-phase</li> </ul>

### Advantages:

- \* Has a full one-year warranty
- \* High rate of temperature reduction
- \* Lower price than similar products



## ➤ High Pressure Syringe Pump

with pressure above 400 bar and accuracy of 0.01 cc/min

◆ Petro Ahoura Co.

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



### Product Introduction:

High pressure pumps are designed and built to perform experiments with low flow rates but with very high accuracy, as well as injection and fluid pressure control in core flooding experiments. In the core-specific analysis laboratory as well as enhanced oil recovery (EOR) laboratories, we always encounter problems of fluid injection into the core sample. Therefore, it is necessary to provide a pump on a high volume laboratory scale, high accuracy and also the ability to work at high pressure. This device has been able to meet the mentioned criteria to a very good extent.

### Main Export Destinations:

Oman

### Export History:

Up to 500,000 \$

### Founded:

2012

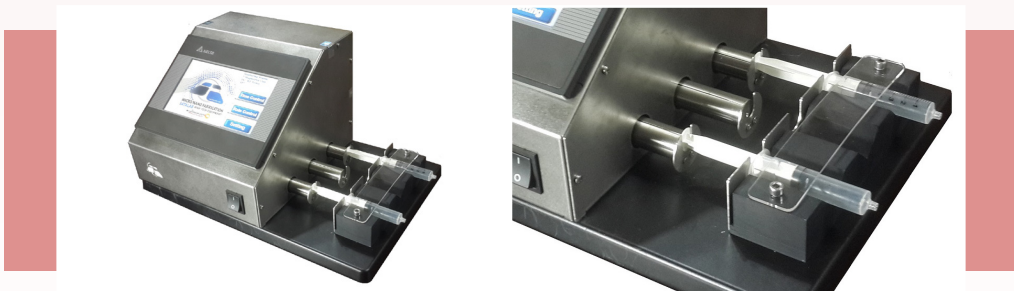
### Application:

Injecting various liquid fluids into high pressure systems

*This product is final B2B equipment.*

### Advantages:

- ✧ Creating a continuous fluid flow with high precision
- ✧ Easy to control by the user



**Application:**

Controlled injection in laboratories, controlled injection for rotational coating, microfluidic equipment

➤ **Advanced Three Independent Syringe Pump**

◆ Samaneh Tajhiz Danesh Co.

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



**Product Introduction:**

Syringe pumps are used to inject or discharge small and accurate liquids, and in cases where precise or microfluidic operation is required. Syringe pump has a wide range of applications for injection or precise and controlled suction of fluids in various applications such as coating, pharmaceutical, medicine, biotechnology, paint industry, oil, nanotechnology. One of the unique features of this product is the independent injection by three syringes in three injection modes: based on time, rate and acceleration. Accelerated injection is used in specific biological applications and for isolating specific cells. In this device, this possibility is provided in the form of steps and ramps.

**Founded:**

2012

*This product is final B2B equipment.*

**Technical Specifications:**

<b>Electric motor</b>	3 stepper motors (accuracy 0.5 micrometers/second) equipped with ball screws
<b>Touch screen</b>	Fully touch screen for entering information with the help of a special pen
<b>Injection control volume</b>	Manual injection rate control by volume rotation
<b>Power supply</b>	85 volt adapter
<b>Dimensions of the device</b>	170 × 170 × 315 cm
<b>Body Material</b>	304 steel body with aluminum bottom

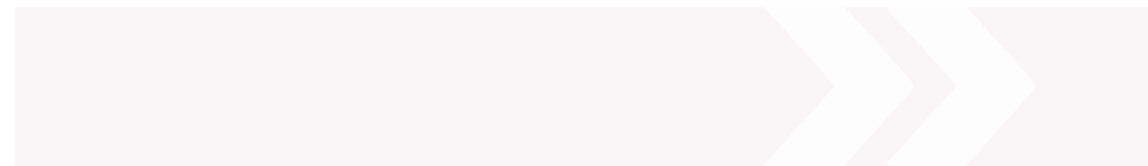
**Advantages:**

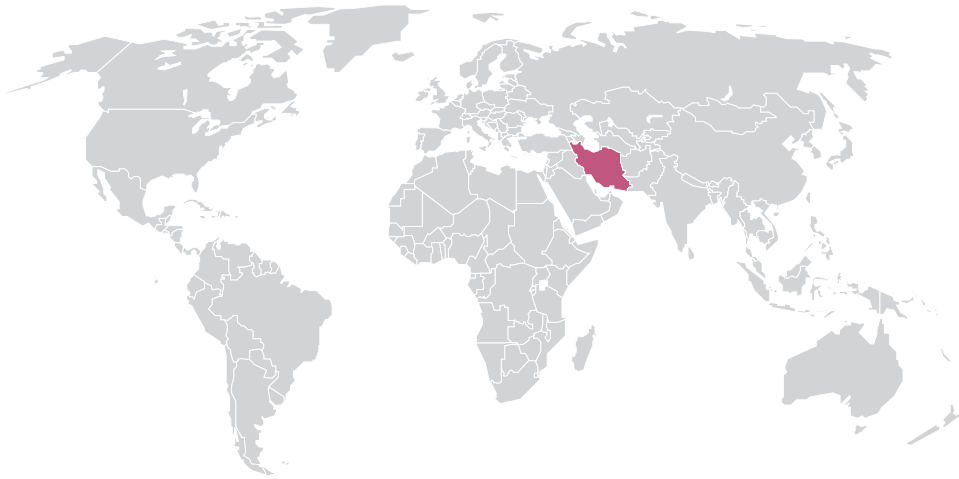
- \* 1 year warranty
- \* 5 years after sales service



### **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

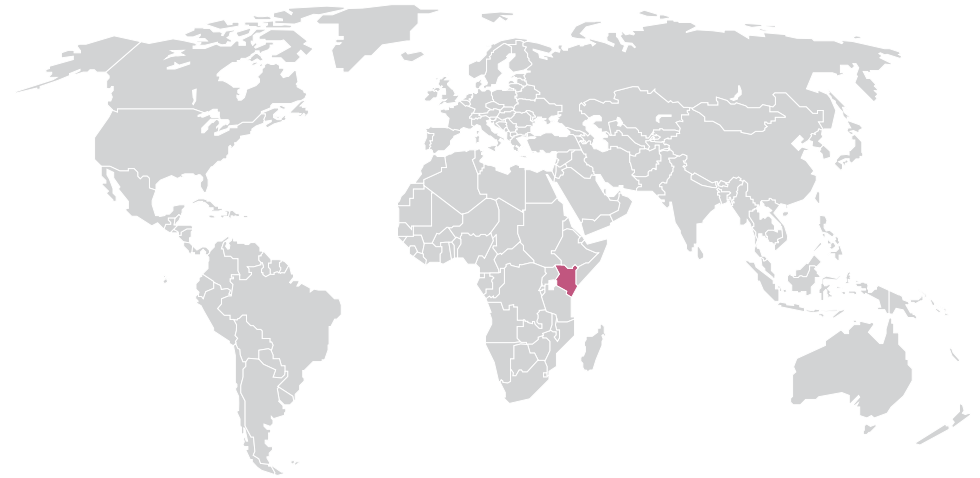
**Address:** Hall 37A, Tehran International Exhibition, Tehran, Iran

**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

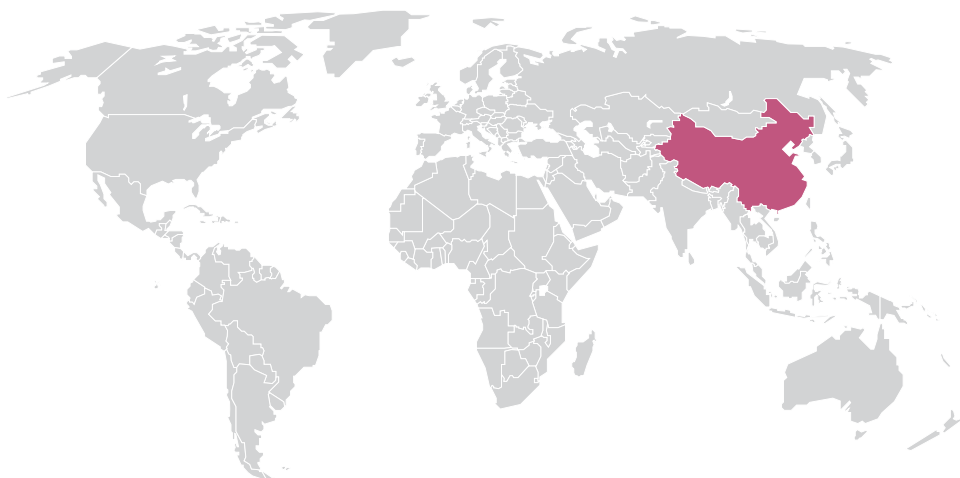
**Address:** Dennis Pritt Road, Next to Maalim Juma Road, Kilimani, Nairobi, Kenya

**website:** [www.ihit.co.ke](http://www.ihit.co.ke)

**Tel No:** (+254) 111 606 113

**Supervisor:** Fahime Zabihi

**Office Phone:** (+98) 21 910 700 80 INT 301



## 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

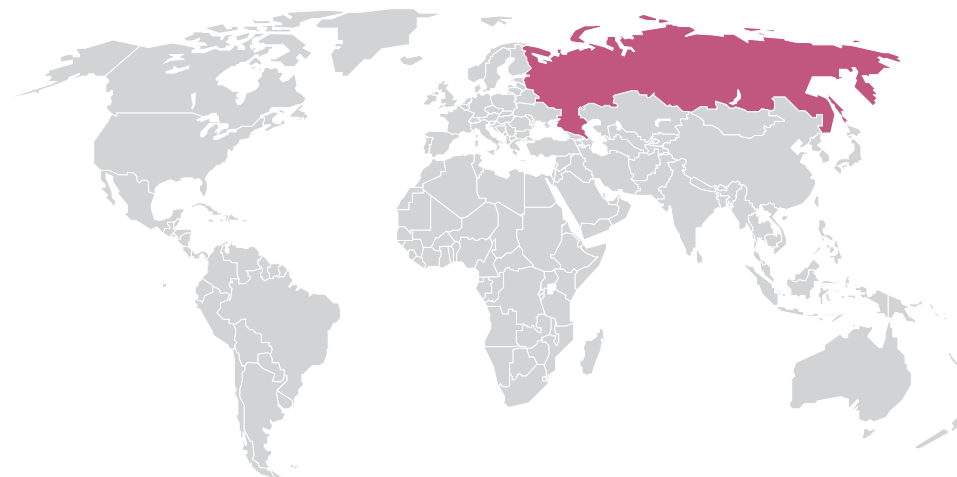
**Address:** Room 88 ,409 Keling Road, Advanced District, Suzhou, Jiangsu Province, China

**website:** [www.innotechexport.ir](http://www.innotechexport.ir)

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

**Supervisor:** Simin Rafeapour

**Office Phone:** (+98) 935 861 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

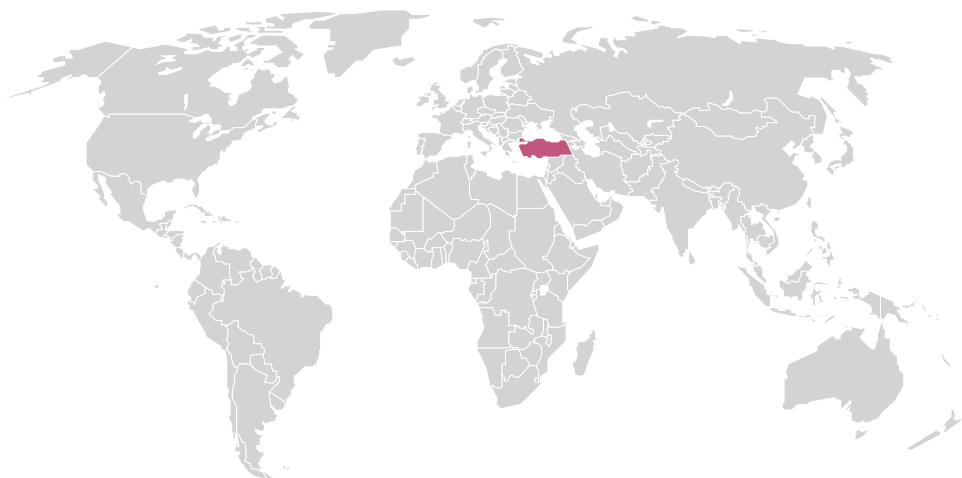
**Address:** No. 7, Unit 4, Arkhangelsky St., Moscow, Russian Federation

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

**Tel No:** (+7) 903 123 16 31

**Supervisor:** Malek Saeidi

**Office Phone:** (+98) 912 617 6293 | (+98) 21 860 537 15 INT 309



## 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

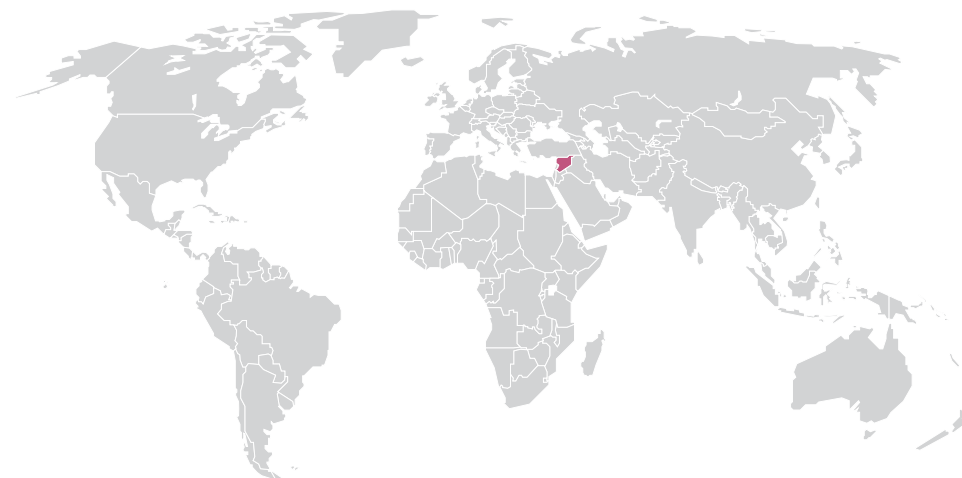
**Address:** Halaskargazi, Halaskargazi Cd. No: 34371 ,66-38 Şişli/Istanbul

**website:** [www.istanbulihit.com](http://www.istanbulihit.com) **Email:** [info@istanbulihit.com](mailto:info@istanbulihit.com)

**Tel No:** (+90) 21 240 141 44 **Whatsapp:** (+90) 533 505 4589

**Supervisor:** Masoud Hasani

**Office Phone:** (+98) 21 882 227 55



## DAMASCUS iHiT

**Manager:** Mohammad Hadi Zeighami

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

**Country:** Syria – 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

**website:** [www.ihit.sy](http://www.ihit.sy)

**Tel No:** (+98) 918 693 39 33

**Supervisor:** Hasan Tahmasebi

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





## Iraq (Sulaymaniyah) iHiT

---

**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

**Address:** Iraq, Sulaymaniyah, Sever St.

**website:** [www.abc-s.com](http://www.abc-s.com)

**Tel No:** (+964) 774 567 03 66

**Supervisor:** Mohammad Mahdi Alebouyeh

**Office Phone:** (+98) 939 124 5009



This book includes  
selected knowledge-based Iranian products  
in the field of

## **LABORATORY EQUIPMENT**

which is prepared for promotion in other countries.



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



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