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

Twelfth Volume

CHEMICALS

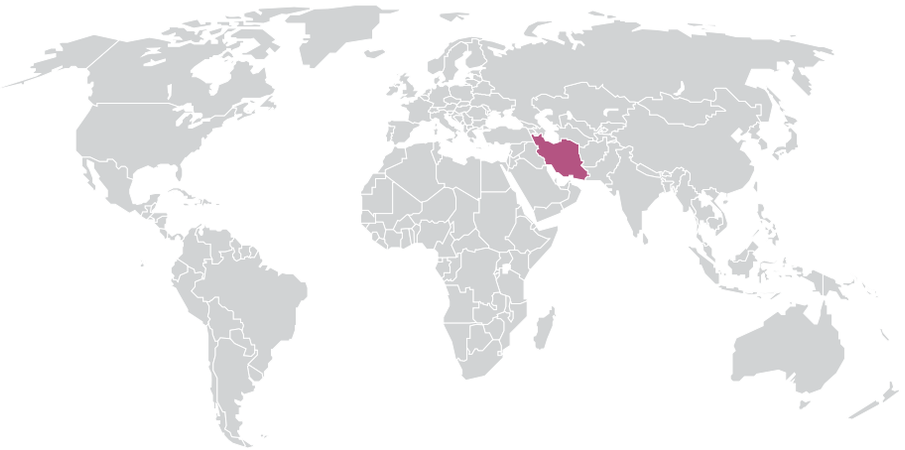
Knowledge-Based Products and Equipment

بسم الله الرحمن الرحيم

TWELFTH VOLUME

Knowledge-Based Products and Equipment

Chemicals



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

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Knowledge-Based Products and Equipment
Twelfth Volume: **Chemicals**

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Preface

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

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

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

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

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

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

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

Evaluation & Editorial team: ***Mohammad Ali Pour Ebrahim, Kaveh Ashjaee***

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

Chemicals

Knowledge-Based Products and Equipment

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Introduction

The Origin of Industry and Export in The Eyes of Iranians

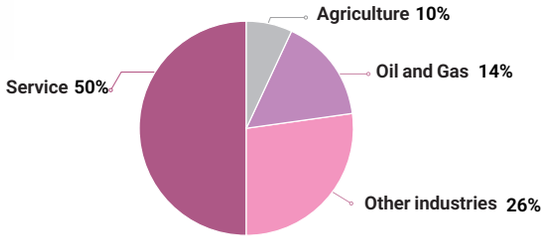
The ancient land of Iran has long been the source of knowledge and industry, and Iranians have played a significant role in the development, evolution and promotion of science and human awareness. Most historians of the world believe that most of the advances in science and human civilization are owed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

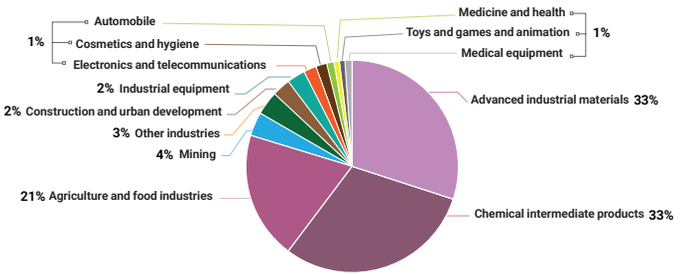


In the meantime, various industries such as pharmaceuticals, medical equipment, construction, communications and telecommunications, energy, mining, chemicals, etc. have a special share of Iran's gross domestic product, and their production, in addition to covering a considerable amount of country's 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 [1]



[1] www.trademap.org

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

Where the New Technologies Stand in Iran's Industry

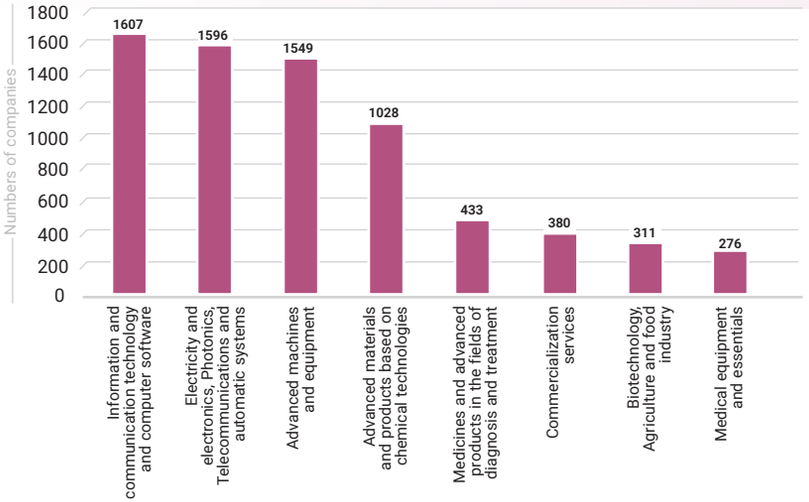
Paying attention to the development of new technologies, commercialization and its influence on manufacturing industries has caused the Islamic Republic of Iran to experience a growing progress in this field in the last decade; An issue that has taken place in Iran in the form of the development of knowledge-based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

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

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

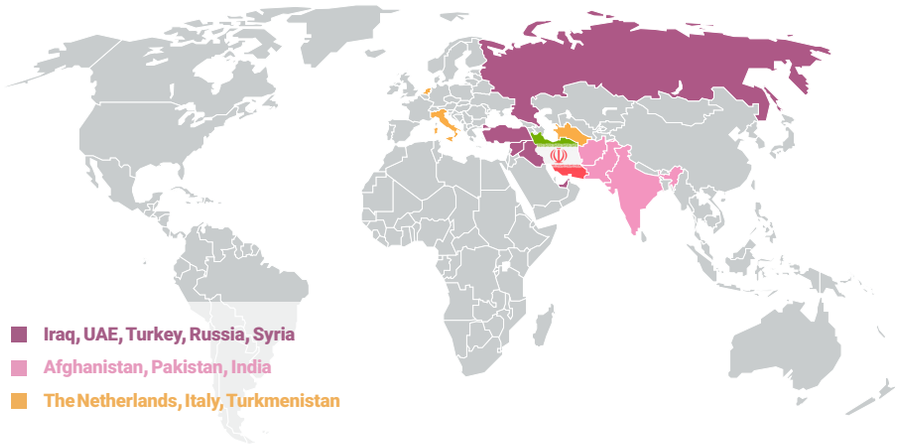
Currently, more than 7 thousand knowledge-based enterprises in Iran are producing products and providing services in the field of various technologies. These companies produce more than 15,000 products or services in total, and their direct employees, which generally include people with a high level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

The Number of Knowledge-Based Companies - Technology Fields



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

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



The Status of Knowledge-Based Products in Chemicals

Due to the wide application of chemicals in various industries and the competitive advantage of the Islamic Republic of Iran in the production of their raw materials, chemicals are among the industries whose development is considered important with the aim of creating added economic value. In this regard, in the last decade, a significant growth has been witnessed in the production of these basic industrial products in Iran. According to the reports of the Central Bank, the share of the industry sector in the GDP is around %26. Regarding the position of chemicals, it can be stated that Iran's petrochemical industry produces a myriad of raw materials required for the production of chemicals, and other industries such as electricity, steel, construction, medical equipment, automobiles, oil and gas, etc., are consumers of these products; Therefore, this industry has a very close relationship with a wide range of industries in Iran. Chemicals also have a special place in Iran›s exports. In the last few years, something like 11,500 million dollars, which comprises about %15 of Iran›s total export has been allocated to the entire field of chemical intermediates annually which consists of three categories: Polymers and polymer composites, paints, resins and adhesives and chemicals in general.

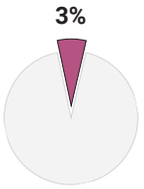
Due to the existence and availability of primary resources for the production of chemical

intermediates in Iran, as well as the reliance of other industries on this industry, the foundations for the growth of technologies and many knowledge-based products have been provided in it. This process is already underway alongside the activity of more than 650 Iranian knowledge enterprises and supply of more than 1100 technological products by them.

In recent years, due to the importance of creation of added value in technology chains related to oil extraction and the development of downstream petrochemical industries, the activity and productivity of knowledge enterprises producing chemical intermediates have experienced a good growth. Allocation of about 10 percent of Iran›s knowledge-based production and employment to this sector demonstrates this thesis.

Finally, regarding the export of knowledge-based products of this industry, it needs to be mentioned that a total of 845 million dollars worth of products of knowledge enterprises active in the field of chemical intermediates have been exported outside Iran in the last 5 years .

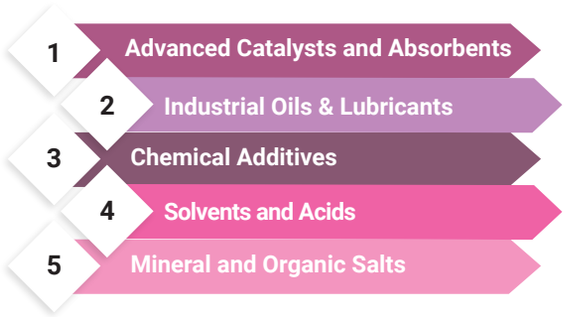
The Percentage of Chemical Intermediates Companies from All the Knowledge-Based Enterprises



The Main Export Destinations of Iranian Knowledge-Based Enterprises in the Fields of Chemical Intermediates

The Division of Knowledge-Based Products in Chemicals

As previously mentioned, the availability of primary resources required for the production of chemical intermediates in Iran, as well as the use of these products in other industries have provided the foundations for the growth of many knowledge-based technologies and products in it. In this book, products have been collected that can 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 Catalysts and Absorbents

Among the most important chemicals with wide industrial application are catalysts and industrial adsorbents. Their importance, regardless of their special place in the industrial production and processing process, is due to their use in processes such as desulfurization, which play a vital role in protecting the environment. These products, which are produced by Iranian knowledge enterprises, have been introduced in the following subcategories:

- **First Section | Molecular Sieves:**

Molecular sieves refer to absorbents with extremely small micrometer or nanometer sized holes and of the same size which are used as an absorbent of gases and liquids. Substances whose molecular dimensions are smaller than the diameter of the molecular sieve›s holes are absorbed and larger substances are removed. The aforementioned method is a sort of advanced filtration whereby the separation process can be performed more effectively than by other membranes. In general, this method is used when other filtration methods are not effective. These sieves are widely used in various industries such as air separation, drinking water treatment and purification, food industry and molecular chemistry and among them can be mentioned aluminosilicates especially zeolites, and some other materials such as clays, silica gel and activated carbon.

- **Second Section | Types of Industrial Catalysts:**

A catalyst is a chemical substance that is used to increase the speed of chemical reactions. In a general classification, catalysts can be placed in two refining and petrochemical classes. The main use of catalysts in various industries is in two processes: cracking (breaking large molecules into small ones) and reforming (rearranging and combining molecules for production). In this subcategory, the catalysts related to these industries have been presented:

- Oil and Gas Catalysts
- Automotive Catalysts

- **Third Section | Types of Absorbents:**

Absorbents are chemical substances that are used for purification (removal of contaminants) from fluids, major separation of one type of molecule from another, etc. In this subcategory, absorbents used for absorbing chlorine, mercury, hydrogen sulfide, etc., are presented, which are used in various industries.

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2 Industrial Oils & Lubricants

Industrial lubricant is a substance that helps facilitate the relative movement of surfaces in contact with each other and reduces friction and wear between them. Moreover, heat transfer, hydraulic energy transfer, prevention of rust and corrosion of metal surfaces, keeping waste materials suspended and preventing their deposition on the system parts, sealing the system and finally mitigating and dampening sudden shocks are among the applications of oils and lubricants. The lubricants introduced in this subcategory are based on petroleum derivatives and incorporate a wide range of products.

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3 Chemical Additives

The vast majority of the products included in this category are additives that are used to create specific chemical properties or to carry out and accelerate a chemical process. These additives include the following subcategories:

- **First Section | Surfactants:**

Surfactant refers to a substance that reduces surface tension between materials and different phases. These substances are widely found in detergents, moisturizing products, foaming agents, emulsifiers and dispersants and are an important component in detergents. In this subcategory, surfactants produced by a number of knowledge enterprises are presented.

- **Second Section | Demulsifiers:**

The presence of water in crude oil causes problems such as increased viscosity, corrosion of pipelines, increased unusable waste, and storage and warehouse problems. By using demulsifiers, the oil-water emulsion can be destroyed or made unstable, thus producing two immiscible and separate phases. In this subcategory, knowledge-based produced demulsifiers are presented.

- **Third Section | Substances that Create Special Properties:**

Additives that create special properties and are used in the production of other chemicals are included in this subcategory. These materials are mainly based on materials such as phenol-formaldehyde resin, amine-tris Triethanol synthesis, silicone, etc., and include:

- Anti-corrosion Materials
- Anti-sediment Materials
- Anti-fire Materials
- Anti-foaming Materials

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4 Solvents and Acids

This subcategory includes all kinds of solvents and acids produced by knowledge enterprises. These products are used in a wide range of industries as raw materials or materials used to process other industrial products. These products are divided into the following two subcategories:

- **First Section | Solvents:**

A solvent refers to a substance that has the ability to dissolve another substance in itself. Generally, no reaction occurs between the solvent and the solute and no new substance is produced. The type of chemical solvent should be selected based on the type of solute and the purpose of the process.

- **Second Section | Acids:**

In this subcategory, all kinds of industrial acids are presented, which include sulfonic, boric, hydrofluoric, and fumaric acids. These products produced by knowledge-based companies have different purity and are mainly classified as strong acids.

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5 Mineral and Organic Salts

Industrial salts produced by knowledge-based companies, which are used in industries such as water and wastewater treatment, tanning, acidification, oil extraction, production of hygiene products and detergents, and many other industries, are presented in this category. These products can be divided into the following two main subcategories:

- **First Section | Mineral salts:**

In this subcategory, industrial salts such as calcium carbonate, calcium chloride, magnesium sulfate, ammonium nitrate, sodium sulfate, etc., all of which have a mineral origin, are presented. These salts, which are produced in different purities, have wide industrial applications such as road de-icing, dust control, dehumidification, adjustment of concrete setting time, pigment, acceleration of combustion, production of various acids, drug production, etc.

- **Second Section | Organic salts:**

The salts in this subcategory are obtained from an organic compound that has undergone a transformation and contains a dense number of ionic compounds, so that their chemical identity depends on the associated ion. Organic salts have special applications in the production of other products and chemicals. In this subcategory, a number of these salts produced by knowledge-based companies have been included.

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Knowledge-Based Products and Equipment

Chemicals

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Advanced Catalysts and Absorbents

- Molecular Sieves
- Oil & Gas Catalysts
- Catalytic Converter
- Absorbents

Second Chapter
Industrial Oils & Lubricants

- Oils, Lubricants & Oil Additives

Third Chapter
Chemical Additives

- Demulsifiers
- Surfactants
- Anti-Corrosion & Anti-Fouling Materials
- Fire Retardant Materials
- Anti Foaming Materials

Fourth Chapter
Solvents and Acids

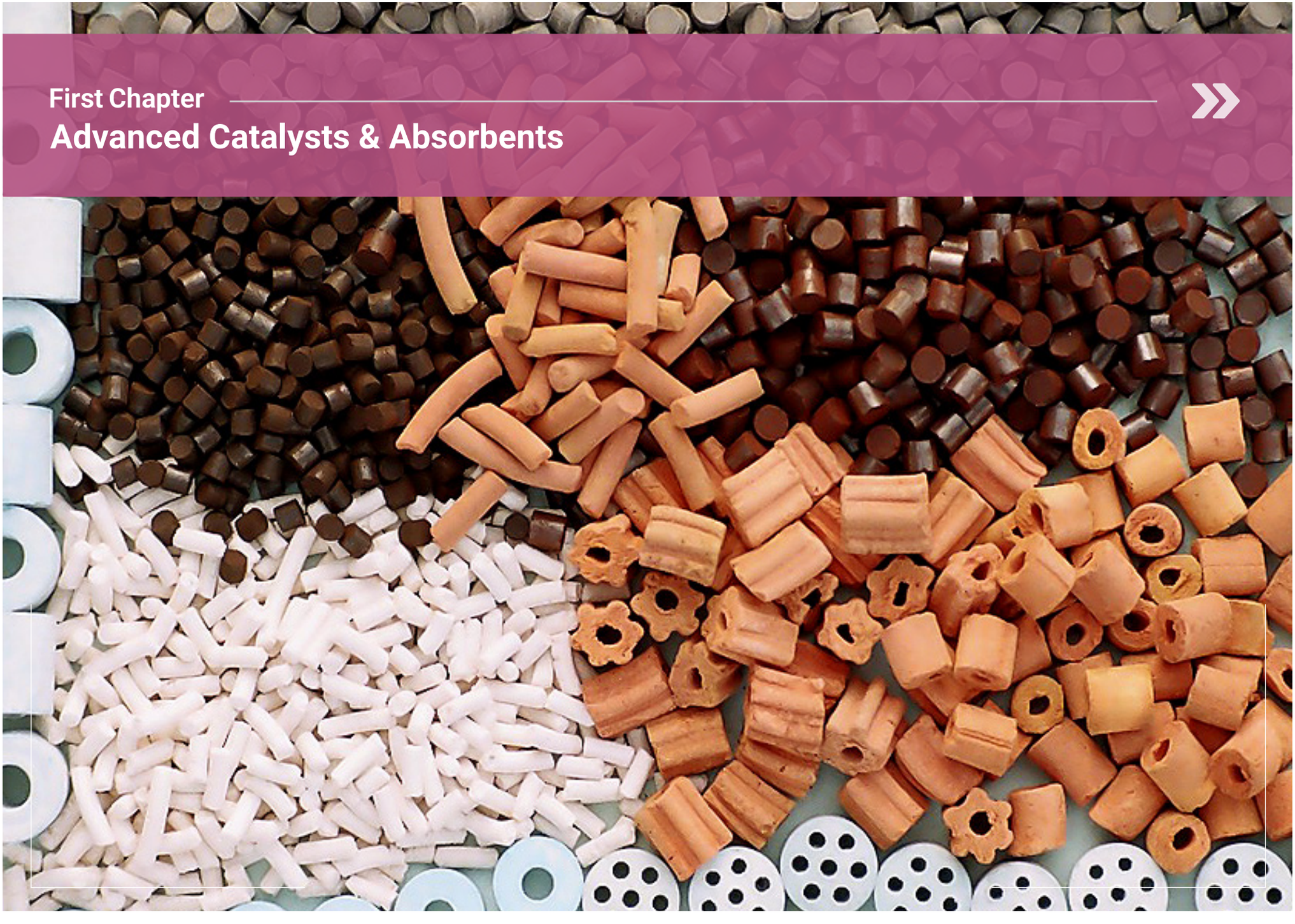
- Solvents
- Acids

Fifth Chapter
Mineral and Organic Salts

- Mineral salts
- Organic salts

First Chapter

Advanced Catalysts & Absorbents



1st CHAPTER

Advanced Catalysts and Absorbents

Sections

Molecular Sieves
Oil & Gas Catalysts
Catalytic Converter
Absorbents

Zeolite Y and its Derivatives (NaY, USY, ReY)

Used in the Catalysts of FCC And RFCC Units (Behda NY, Behda UY, Behda RY)

Behdash Chemical Co.

www.behdashco.com

Product Introduction:

Zeolites are generally minerals that are mainly composed of aluminosilicates with a regular crystalline structure, and they are commercially used in various industries as surface adsorbents. Among natural zeolites, only 9 types such as clinoptiolite, natrolite and stilbite are found in nature, and a large number of them are synthesized artificially and through chemical reactions. The structure of zeolite Y has a three-dimensional pore system in which the pores of 3.7 angstroms connect larger cages (with a diameter of 13 angstroms) to one another, which are known as supercages in this zeolite.

Main Export Destinations:

India, Turkey, Malaysia, UAE, Oman, Azerbaijan, Uzbekistan, Armenia, Ukraine, Indonesia, Taiwan, Kazakhstan, Kyrgyzstan, Iraq, Pakistan, Afghanistan

Export History:

Between 50,000,000 - 100,000,000 $

Founded:

1982

Application:

Zeolite Y is the main catalyst component used in FCC/RFCC refinery units. The selectivity and catalytic activity of these types of catalysts are due to zeolite Y. Although this zeolite has other applications such as dehumidification, its mainly used in the world as the main catalyst component of the FCC/RFCC residue fluid catalytic cracking process.

This product is a final B2B consumer product.

Technical Specifications:

In the process cycle, first this product is prepared using silicate and aluminate sources. Due to the semi-stable nature of zeolite Y, its manufacturing steps must be carefully controlled, otherwise the final product will be another material and will not be used.

Usually, solutions containing sodium hydroxide (caustic soda) are used for the synthesis of zeolites. Sodium in soda as a positive ion neutralizes and balances the tetrahedral negative charge of aluminum. This zeolite is called soda Y or NaY. Common sources of silica and alumina are sodium silicate and sodium aluminate, respectively. Crystallization of zeolite Y usually takes place within 35 hours at 100°C. Production of a high quality zeolite requires precise control of temperature, time and pH of the crystallization solution. NaY zeolite is separated from the crystallization solution after filtration and washing with water. NaY zeolite is not hydrothermally stable due to its high sodium content. The size of the particles, the size and volume of the holes and the active surface area of the product are its important features.

Advantages:

- High quality at a competitive price
- High production volume

3A and 4A Zeolites

Behdash Chemical Co.

www.behdashco.com

Product Introduction:

Zeolites (Zeolites) are a type of molecular sieves, which, due to the high polarity of the internal surfaces of their cavities, are among the most important selective surface (physical) absorbers of water, water-soluble salts, and impurities and pollutants in water streams. In this way, they can be useful in wastewater treatment. These compounds are a type of aluminosilicate, which have different types based on their molecular structure and crystal network, and they can be divided into two types of natural and synthetic zeolites. Among the most important synthetic zeolites, we can mention zeolites A, X, Y and ZSM-5. Zeolite A has three different types named 3A, 4A and 5A. The reason for naming three types of zeolite A is because of their pore sizes, which are 3Å, 4Å and 5Å, respectively. The pore size is the main factor in absorption speed, absorption power and also the type of material that can be absorbed. These three types of zeolite can be converted into each other through the process of ion exchange in an environment saturated with metal salt.

Main Export Destinations:

India, Turkey, Malaysia, UAE, Oman, Azerbaijan, Uzbekistan, Armenia, Ukraine, Indonesia, Taiwan, Kazakhstan, Kyrgyzstan, Iraq, Pakistan, Afghanistan

Export History:

Between 50,000,000 - 100,000,000 $

Founded:

1982

Application:

Among the applications of these compounds are the removal of oil and gas sulfur compounds such as mercaptans and H_2S (which is essential in the process of refining crude oil and gas) as well as air pollutants such as CO and CO_2. Another important application of these zeolites is the use in washing powders as an agent for absorbing calcium ions from water.

This product is a final B2B consumer product.

Technical Specifications:

The production steps are:

1. The reaction of the aluminum source (sodium aluminate) with the silicate source (sodium silicate) in the presence of sodium hydroxide and forming a gel
2. Gel aging
3. Hydrothermal reaction under specific temperature (about 100 °C) and time (crystallization reactor)
4. Concentration of zeolite cake formed from aqueous solution using Belt Filter system
5. Washing and drying the product using the Spin Flash Dryer method at 260 °C

Advantages:

- Production in high volumes
- Competitive price

Molecular Sieves Based on 3A, 4A, 5A and 13X Zeolites

Researching and Manufacturing Gaharceram Co.

www.gaharceram.com

Product Introduction:

Zeolites are a type of molecular sieves, which, due to the high polarity of the internal surfaces of their cavities, are among the most important selective surface (physical) absorbers of water and sulfur compounds of oil and gas (such as mercaptans and H_2S), which is essential in the crude oil and gas refining process. In addition, they absorb impurities and pollutants from water streams (essential in wastewater treatment) as well as air pollutants such as CO and CO_2 well. These compounds are a type of aluminosilicate, which have different types based on their molecular structure and crystal network, and they can be divided into two types of natural and synthetic zeolites. Among the most important synthetic zeolites, we can mention zeolites A, X, Y and ZSM-5. The reason for naming three types of zeolite A, namely 3A, 4A, and 5A, is because of their pore sizes, which are Å3, Å4, and Å5, respectively. The size of the hole is the main factor in the speed of absorption, the strength of absorption and also the type of material that can be absorbed. These three types of zeolite can be converted into each other through the ion exchange process in an environment saturated with the corresponding metal salt.

Main Export Destinations:
Armenia, Iraq

Export History:
Up to 500,000 $

Founded:
1994

Application:

- **Zeolite 3A:** sodium-potassium aluminosilicate with a pore diameter of 3 angstroms, used in the deep drying (dehydration) of fuel gases from the cracking process, unsaturated hydrocarbons (ethylene, propylene, butadiene and acetylene), aromatic compounds (BTX), light alcohol solvents (ethanol and methanol) and food grade CO_2 gas.
- **Zeolite 4A:** sodium aluminosilicate with a pore diameter of 4 angstroms, used in drying gases, natural gas, alkane solvents, gases such as argon, drying agent for pharmaceutical packaging and electronic components.
- **Zeolite 5A:** calcium-sodium aluminosilicate with a pore diameter of 5 angstroms, used for drying natural gas and absorbing CO_2, CO and H_2S, nitrogen, hydrogen and inert gases.
- **Zeolite 13X:** X-type sodium aluminosilicate with 9 angstrom pore diameter, used for absorption of water, mercaptans and CO_2, typical industrial air drying, low recovery temperature and long service life.

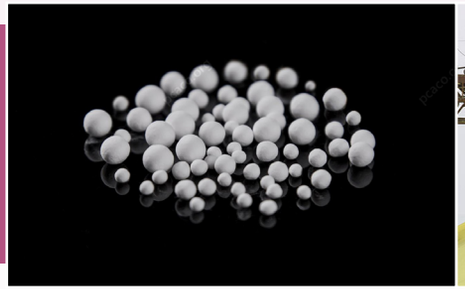
This product is a final B2B consumer product.

Technical Specifications:

Synthetic zeolites consist of three main bases: zeolite powder, binders and other additives needed to improve properties.
In general, the production process of these products includes the process of preparing the raw materials, mixing the components (in the right proportion and based on the formulation according to the specific application) and proper shaping. Based on the need, this shaping can be spherical (bead) (through the pen granulator or bead former) or string (through the extruder). Next, in order to remove the physical water in the macropores, drying is done. Finally, in order to remove the chemical water present in the meso and micro pores and increase the thermal, mechanical and chemical stability, calcination and activation operations are performed.
Various BET, XRD, XRF, ICP, Atomic Absorption and Particle Size, Strength (Crush) and Attrition analyzes have been conducted by the company.

Advantages:

- Based on international standards
- Competitive price
- Proper production volume



SRU Sulfur Recovery Catalysts, Oxygen Scavenger, Titanium Oxide

Researching and Manufacturing Gaharceram Co.

www.gaharceram.com

Product Introduction:

Sulfur Recovery Unit or SRU is used in the famous Claus process in gas and crude oil refining companies to convert hydrogen sulfide (H_2S) to sulfur (S).

Main Export Destinations:
Armenia, Iraq

Export History:
Up to 500,000 $

Founded:
1994

Application:

Oil and gas refining

This product is a final B2B consumer product.

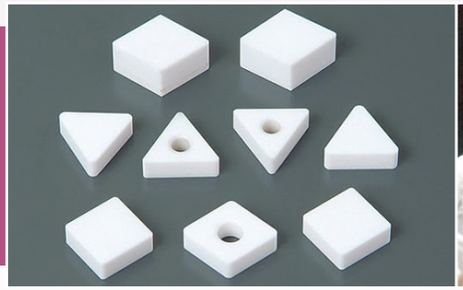
Technical Specifications:

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

1. Aluminum-based catalysts (ρ-Alumina and γ-Alumina)
2. Oxygen scavenger catalysts (treated with iron)
3. Titanium oxide catalysts: it has multiple applications. The main role of this catalyst is to decompose and convert CS_2 and COS compounds in the Klaus process to H_2S after the catalyst function and sulfur production. Basically, because the C_S2 and COS compounds in the Klaus process cannot be converted into molten sulfur and enter the environment as pollutants, due to the new environmental standards, refineries and petrochemicals are not allowed to release these compounds. Therefore, in order to eliminate these compounds, there is a need for a catalyst that can convert these compounds into H_2S through the reduction process, and the produced H_2S returns to the beginning of the Claus cycle and turns into elemental sulfur in the corresponding catalyst bed.

Advantages:

- High quality
- High production volume



Gamma Alumina-Based - Gamma Alumina Catalyst
with Catalyst Base Synthesis

Nano Pars Spadana Co.

www.nanops.ir

Product Introduction:

This catalyst is used in the benzene chlorination unit of petrochemical industries. In this unit, the benzene in the EDC feed is a harmful factor for the continuation of the process and environmental pollution. The feed containing benzene and chlorine gas enters the reactor with gamma alumina catalyst and this catalyst selectively chlorinates benzene with high conversion percentage. Chlorinated benzene can be easily separated from the original feed.

Gamma alumina or activated alumina has important physical and chemical characteristics, some of which are: high specific surface area, high mechanical (abrasion) and chemical resistance against acids and amphoteric property, porosity with nanometer dimensions, etc. For this reason, it can be used as a catalyst, catalyst base or adsorbent in many processes and reactions.

Founded:
2007

Application:

Some of the industries that use it include: oil, gas, petrochemical and other industries, such as steam reforming catalysts in steel industries, catalysts that reduce car pollutants, endothermic catalysts used in metallurgical and component manufacturing industries, etc.

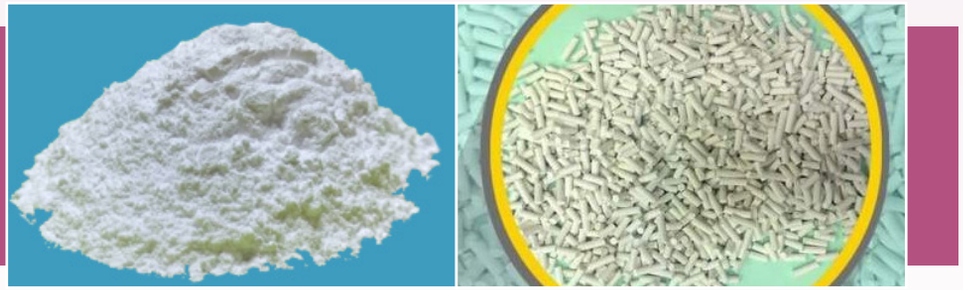
This product is a final B2B consumer product.

Technical Specifications:

In this company, all stages of catalyst manufacturing from the base to the refinement stages have been done and by optimizing the production method, hole size, spatial distribution of holes and uniformity in the shape of the pores, better chemical and thermal stability has been created with the lowest cost. The presence of different stages of synthesis, the number of different components with high purity, the method of calcination operation and special standards in the use of the product and finally the long research and development process have increased the quality of the product.

Advantages:

- Vendor list of domestic petrochemicals
- Good quality



High Purity Alumina Catalyst and Adsorbent
Active Alumina

Ardakan Industrial Ceramics Co.

www.aic.ir

Product Introduction:

Active alumina is a product of aluminum hydroxide processing and has a very high absorption power. This material absorbs liquids and gases and does not soften, disintegrate or change its shape when immersed in liquids. Activated alumina has many tiny pores that act like a tunnel, so that when air enters this tunnel, water molecules are trapped, and the water in the air (moisture) sticks to the alumina, and when it passes through this tunnel, it dries. Also, active alumina with specific surface area above 300 m^2/g and high porosity can be used as a catalyst in sulfur recovery unit (SRU), dehydration of alcohols and isomerization of olefins.

Main Export Destinations:
China, Germany, Azerbaijan, Turkmenistan

Export History:
Up to 500,000 $

Founded:
1996

Application:

Activated alumina as a moisture absorbent with a contact surface of more than 200 square meters per gram. This material is used for drying air, dehydration of natural gases and liquefied gases.

This product is a final B2B consumer product.

Technical Specifications:

To produce this material, a method called GRANULATION PAN is used. In this method, in the first step, a flash calcination system is used to produce active alumina powder. For this purpose, the primary powder with specific granularity enters a tunnel-shaped path through a rotating plate with a specific drop rate and is exposed to a temperature of 550 to 700 degrees Celsius for a very short time. In this way, while creating an incomplete break between hydride bonds, finally active alumina powder is produced.

Advantages:

- High quality
- High production volume

Titania Catalyst

Ardakan Industrial Ceramics Co.

www.aic.ir

Product Introduction:

This catalyst is produced from titania compounds plus necessary additives during the process of material preparation, shaping and baking. It is used as one of the catalysts of sulfur recycling units for the hydrolysis of sulfur-containing organic compounds in order to increase the conversion rate of the unit. Another important feature of these catalysts is that they allow the reaction to take place at a lower temperature. The amount of titania used in these catalysts is usually more than 85%.

Main Export Destinations:

China, Germany, Azerbaijan, Turkmenistan

Export History:

Up to 500,000 $

Founded:

1996

Application:

Refinement of gas and crude oil.

This product is a final B2B consumer product.

Technical Specifications:

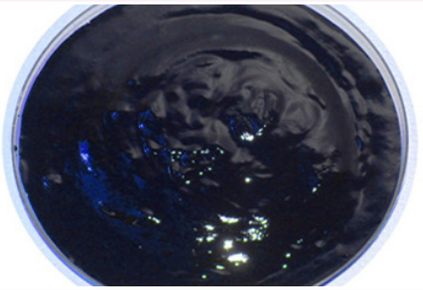
First, the initial titania powder with a special surface and suitable porous volume is added to the rotating cylinder to make it uniform and produce a suitable paste. Then, the appropriate pore-forming additive is dissolved in a certain percentage of water and added uniformly to the main powder. The blades of the powder machine mix the water solution and the additive well over a certain period of time, and a uniform and homogeneous paste is finally obtained. It should be noted that the additive used in this step should be selected in such a way that firstly it creates the required porosity and secondly, its remaining impurity does not harm the final product.

In the following, the extrusion process is used to obtain filament-shaped catalysts. The production strands are then transferred to the drying chambers with the aim of removing water and surface humidification and thus facilitating the calcination process, and finally the dried product is transferred to the wagon shuttle furnaces for calcination.

TiO_2 min 85 BET(m^2/gr) min 280 (Total pore volume) 0.4cm^3/gr

Advantages:

- Proper purity
- Competitive price
- Being in the vendor list of National Gas Company



Catalysts for Mercaptan

Removal by the MEROX Method (Par-MO-Cat)

Pars Pigment and Catalyst Co.

www.ppandc.com

Product Introduction:

The primary washing of oil cutting is done using 2% soda. The extraction of light mercaptan (methylethyl) is done using a 30% soda solution along with a catalyst soluble in soda in the extraction tower. From the catalytic oxidation of heavy mercaptans in the vicinity of liquid catalyst and oxygen, sulfide dioxide is created.

Founded:
1976

Application:

The mercaptan removal catalyst is used in the MEROX process (MEROX = MERCAPTAN OXIDATION) in oil and gas refineries in order to convert methyl and ethyl light mercaptan sulfur compounds into disulfide in liquid gas and kerosene compounds.

This product is a final B2B consumer product.

Technical Specifications:

The catalyst used in these processes are metal-organic compounds called metal-phthalocyanines. Cobalt, ruthenium, etc. metals are used as active metals. In the company›s two-step method, it is first prepared from the dry mixing of raw materials urea, sodium orthophthalic acid, cobalt salt and two other components by Ball mill at high temperature and with metal-phthalocyanine intermediate. After preparation of the metal-phthalocyanine intermediate, the sulfonation step is carried out by oleum.

HDS Hydrodesulfurization Catalysts (Par-Hyd-Cat)

Pars Pigment and Catalyst Co.

www.ppandc.com

Product Introduction:

Hydrodesulfurization is a process in which sulfur-containing components present in crude oil or natural gas cuts used in petrochemicals are removed by reaction with hydrogen. This process results in the removal of nitrogen and oxygen along with the hydrogenation of aromatics and olefins; Therefore, the set of these processes is called hydrotreating.

Heavy metals, aromatics and olefins can also be removed with the help of par-Hyd catalysts. Hydrotreating simply leads to the conversion of organic compounds containing sulfur, nitrogen and oxygen into hydrocarbons and hydrogen sulfide, ammonia and water, respectively. At the same time, it is possible to convert olefins and aromatics into saturated hydrocarbons without any cracking process on hydrocarbons. In fact, this process leads to the production of fuels with the lowest amount of sulfur and impurities. With the passage of time and heavier crude oil entering the refineries, the amount of sulfur compounds in the hydrocarbon cuts from the distillation tower has also increased. Environmental regulations based on the production of refined products, including gasoline and diesel, are compatible with quality and environmental standards in such a way that the permissible limit of pollutants is reduced every year; Therefore, refiners have been directed to use processes to reduce the amount of sulfur and polluting compounds in hydrocarbon cuttings. Due to the catalytic nature of this process, this product includes the catalyst used in these processes.

Founded:
1976

Application:

Refinement of gas and crude oil in special processes.

This product is a final B2B consumer product.

Technical Specifications:

To make this type of catalyst, gamma-alumina is often used as a catalyst base. The active metal catalyst is nickel or cobalt and molybdenum, which is added to the catalyst base using various methods, including common Impregnation methods. It is worth mentioning that due to the existence of different cuts in an oil refinery, such as naphtha, kerosene, gas oil, and mazut, a special process and catalyst are used for each of these cuts. Naphtha catalysts include naphtha hydrotreating (NHT), kerosene hydrotreating (KHT) and gas oil hydrotreating (GHT) catalysts.

The preparation of these catalysts consists of several steps:

1. Preparation of catalyst base or support, which is usually a formulation based on gamma alumina. (The company claims that it uses gamma alumina produced by the company itself).
2. Formation of the catalyst base
3. Drying and curing the catalyst base
4. Solubilization of catalyst salts, which are water-soluble salts of active metals (nickel, cobalt, and manganese).
5. Impregnation of the catalyst solution on the catalyst base
6. Heat treatment and final drying (removal of physical water) and calcination (removal of chemical water in meso and micro pores) of the catalyst

Catalyst for Desulfurization of the Output Gas Streams of Claus Process with COS and CS_2 Compounds (Par-Cata-Mond-Gas)

Pars Pigment and Catalyst Co.

www.ppandc.com

Product Introduction:

COS and CS_2 compounds in the Claus process cannot be converted into molten sulfur and enter the environment as pollutants; Due to the new environmental standards, refineries and petrochemicals are not allowed to release these compounds. As a result, in order to eliminate these compounds, there is a need for a catalyst that can convert these compounds into H_2S through the reduction process, and the produced H_2S returns to the beginning of the Claus cycle and turns into elemental sulfur in the corresponding catalyst.

Founded:
1976

Application:

The properties of bentonite include: softness, swelling, relatively good ability to mix with water, pastiness, plasticity, adhesion and absorption. For this reason, this substance has many uses, which include: production of catalytic absorbent soil, drilling mud, softener of sanitary detergent powders, preparation of casting sand, bedding soil for pets, preventing water leakage in dams and water supply channel, clarifying agents for liquids such as juices and wine, clarifiers and other sprayable substances, preparation of plant and animal poisons, fillers in industries such as papermaking, production of cleaners and detergents, and preparation of all types of ceramics and paint removal and refining of all types of oils.

This product is a final B2B consumer product.

Technical Specifications:

The catalyst is similar to HDS catalysts, whose active metals are nickel, cobalt and molybdenum based on alumina. But there are many differences both in the base (shape, size of holes, acidity level, extrusion and calcination methods) and in the type and amount of active metals.

Cobalt-Manganese-Bromide (CMB) Catalyst

Used in the Production of Terephthalic Acid with the Synthesis of Cobalt Acetate and Manganese Acetate

Arya Shimi Rasa Co.

www.aryashimirasa.com

ARYA SHIMI RASA

Product Introduction:

CMB catalyst is a combination catalyst of three basic components of manganese, bromine and cobalt. This catalyst is in a red liquid state, which changes the ratio of these elements according to the type of technology used. This product is a liquid and homogeneous catalyst that enters the process and exits after playing a catalytic role. This catalyst is used to produce PET with different grades, including edible grade, as the primary polymer of liquid bottles (PET bottles).

Founded:
2004

Application:

This catalyst is used to convert paraxylene to terephthalic acid in the polymerization processes of terephthalic acid with ethylene glycol to produce polyethylene terephthalate (PET).

This product is a final B2B consumer product.

Technical Specifications:

This catalyst is a homogeneous and mixed catalyst that is used in modern PET production technologies in the world. In order to be effective and to produce the right product quality, this catalyst must have certain characteristics. One of the special features of this catalyst is its low corrosion rate, which reduces production costs. The second feature of this catalyst is its easy use and reduction of catalyst preparation steps for use. The third feature of this catalyst is its reasonable price compared to previous catalysts used in PET production industries.

Advantages:

High volume sales to domestic petrochemicals (in Iran)

Vanadium Pentaoxide Catalyst

Iranian Catalyst Dvelopment Co.

www.icdco.ir

Product Introduction:

Vanadium pentoxide is a yellow solid mineral compound with the chemical formula V_2O_5, molecular mass 181.88 g/mol, density 3.357 g/cm^3, melting point 690 °C and solubility 8 g/L at 20 °C. It turns orange when dissolved in water, and due to its high oxidation property, it is both an amphoteric oxide and an oxidizing agent.
One of the most important steps in the production process of sulfuric acid and sulfonic acid is the oxidation of SO_2 to SO_3. Vanadium pentaoxide catalyst is used for this process. SO_2 gas along with O_2 and N_2 gases are passed over the catalyst and during the passage over the catalyst, SO_2 absorbs and performs oxygen exchange on the active sites of the catalyst. The result of this process is the conversion of the catalyst to SO_3.

Main Export Destinations:
Iraq

Export History:
Up to 500,000 $

Founded:
2011

Application:

Vanadium pentoxide is one of the important catalysts used in chemical oxidation processes (such as production of terephthalic acid from paraxylene, production of sulfuric acid from sulfur in the presence of oxygen). This material is used as one of the important elements in the production of steel and other steel or aluminum alloys for use in the aerospace industry. Adding small amounts of this material to stainless steel alloys increases its strength 7 times.

This product is a final B2B consumer product.

Technical Specifications:

The production process of this catalyst, which is used as a fixed bed, includes the following four parts:

1. Preparation of the paste, which is a formulation of vanadium pentoxide silica or diatomaceous earth (the dominant part of the formulation), mineral binder which is mostly sodium silicate (glass water).
2. Forming the dough, which is in the form of an extruder. In this context, horizontal or vertical extruders can be used.
3. Drying
4. Calcination. This stage is very sensitive to the temperature profile, time control and heating speed, which is done continuously in the furnace.
5. Identification analyzes such as XRD, BET, SEM-EDAX, as well as functional analyzes such as compressive strength, scratch resistance, density, capacity, strength and absorption speed have been performed by the company.

Advantages:

- Higher efficiency compared to the foreign sample available in the Iranian market
- Higher mechanical resistance than the foreign sample
- Higher useful life compared to the foreign sample
- Lower prime cost compared to the foreign sample
- Production of sulfuric acid with better quality and more quantity
- Catalyst consumption is less in sulfuric acid factories compared to the use of foreign samples

Vanadium Pentoxide Protective Catalyst

Used in the Production of Sulfuric Acid and Sulfonic Acid

Feeyar Industrial Group

www.feeyar.ir

Product Introduction:

In sulfonic acid production plants, such as the production of detergent raw materials (such as linear alkyl benzene sulfonated (LABS) and sulfuric acid), especially metallurgical units that have heavy metals, toxic gases and moisture, the expensive V_2O_5 catalysts of the main reactor are subject to poisoning, pulverization and pressure drop. As a result, it causes expensive shutdowns of acid plants, high electricity consumption of blowers and reduced profitability. One of the reasons for the failure and rapid pressure drop of these catalysts is the entry of toxic polluting elements (fluorine, chlorine and arsenic) which causes the loss of the adsorbent, reducing its activity, pulverization and increasing the pressure drop. One of the reasons for the failure and rapid pressure drop of these catalysts is the introduction of toxic polluting elements (fluorine, chlorine and arsenic). These elements cause the loss of the adsorbent, decrease its activity, pulverize and increase the pressure drop.

The use of protective catalysts makes the toxic pollutant elements to be removed before contact with the main catalysts, and the problem of pressure drop is eliminated and less pressure is applied to the blower. As a result, in addition to reducing electricity consumption, the catalysts are less damaged and the life of the catalysts increases.

Founded:

2016

Application:

Sulfuric acid and sulfonic acid production factories

This product is a final B2B consumer product.

Technical Specifications:

Protective catalysts are used in the first to fifth beds of reactors of sulfonic and sulfuric acid plants, depending on the single or double absorption process system. In case of single absorption in the first bed of the reactors, due to the use of diesel when heating the converter, 5 to 7 cm (depending on the process conditions) of catalyst is used; This amount is three centimeters in other beds. In double absorption processes, if the process system is 3+2 or 7 ,1+4 cm of protective catalysts are poured into bed 4 or bed 5. The reason why more catalysts are used in these beds is to prevent the sulfuric acid vapor that has passed through the demister pads in the absorption tower. In this situation, protective catalysts play the role of protection and safety shield. The creativity of the company in the development of this product is that, in fact, the manufactured product has the ability to completely replace the original catalyst, and with the improvements made by the company, it plays both the role of a catalyst and a protector.

Advantages:

- High Quality
- High production volume
- Consistency in quality
- Reasonable price

Catalytic Converter in Automotive Exhaust

Iran Delco Co.

www.irandelco.com

Product Introduction:

Generally, Catalytic Converters are made of silicon carbide (rarely) or aluminum oxide and silica; Inside the catalyst, precious metals have been coated and increased the price of the catalyst.
Automotive catalysts are mainly installed in two ways: UNDER BODY at a distance of 1 to 1.5 meters from the engine or CLOSE COUPLED with direct connection to the exhaust manifold. In the second case, the pressure, temperature, and abrasion are higher, and as a result, the stress on the part is higher. On the other hand, placing the monolith and mat inside the shell (canning) can be done as a clam shell (opening the shell and placing the catalyst and welding) or hard stuff (the monolith is inserted into the shell through a funnel).

Main Export Destinations:
China

Export History:
Up to 500,000 $

Founded:
1991

Application:

These catalysts, which are installed as a set on the car, have the task of converting the pollutants coming out of the exhaust into less dangerous substances. Therefore, these catalysts are generally installed on passenger cars, heavy vehicles and motorcycles.

This product is a final B2B consumer product.

Technical Specifications:

The core of the catalytic converters of all domestically produced cars made by this company is made of ceramic material. Metal core is used for motorcycles and expensive foreign cars. The coating, which is prepared in the operation and is also called washcoat, includes basic, enhancing and stabilizing materials, as well as catalyst metal salts, which are from the group of precious metals: palladium (Pd), platinum (Pt) and rhodium (Rh), which are known as PGM metals.
In the production process, washcoat materials are first produced based on specific formulations, including base materials, enhancers, stabilizers, and precious metals. Then the pulsed laser deposition of the washcoat material on the core (monolith) is done through the suction or blowing process by air pumps, and after the drying and calcination process, the coated monolith is placed in a thermal-mechanical insulator and then covered with metal.
Therefore, this product or catalyst is very effective in reducing air pollution. The triple catalytic converter performs the following three tasks:

a) reduction of nitrogen oxides to oxygen and nitrogen through the reaction:
$NO_x \rightarrow xO_2 + N_2$

b) Oxidation of carbon monoxide to carbon dioxide through the reaction:
$CO + 2/1O_2 \rightarrow CO$

c) Oxidation of unburned hydrocarbons and their conversion into carbon dioxide and water through the reaction:
$C_xH_{2x+2} + [(3x+1)/2]\ O_2 \rightarrow xCO_2 + (x+1)H_2O$

Advantages:

High quality at a competitive price

International Standards or Permissions:

- Car converter catalyst test analysis (LIGHT-OFF), measurement of oxygen storage capacity (OSC), XRF, ICP-OES, gravimetry, BET MULTI POINT (BJH), H2-TPR, TPO, NH3-TPD and CO CHEMISORPTION have been performed.
- The company's products are based on Euro 4 and 5 standards.

Chlorine Absorber (Chlorine Guard), Mercury Absorber (Mercury Guard) and Arsenic-Phosphine Absorber

Researching and Manufacturing Gaharceram Co.

www.gaharceram.com

Product Introduction:

In naphtha reforming units (CRU & CCR), noble metal catalysts based on chlorinated alumina are used to increase the octane number of naphtha cuts. The presence of chlorine in the composition of such catalysts is essential. But the noteworthy point is that after a while and after the passage of the hydrocarbon flow, some chlorine is separated from the catalyst surface, and this chlorine is observed in the gas (hydrogen) and liquid (hydrocarbon cut) output flow, where it is generally in the form of inorganic chlorine (HCl) and organic chlorine (R-Cl).

Crude oil and gas condensates extracted from reservoirs contain amounts of various metals (including mercury). In addition to safety and biological issues, the presence of mercury in these streams causes several process problems: corrosion in transmission pipes, loss of performance of catalysts in various units, and destruction of aluminum parts in converters.

The presence of pollutants such as arsenic and some phosphorous compounds including phosphine in the feed of petrochemical units, even in very small amounts, can cause a decrease in process efficiency and permanent poisoning of downstream catalysts. Therefore, the complete removal of these compounds from process streams is always one of the challenges in the petrochemical industry. Among the various arsenic compounds, arsine with the chemical formula AsH_3 is the simplest and at the same time the most common compound found in hydrocarbon streams. Due to its greater abundance compared to others, the oil and gas industry usually considers all arsenic content in streams to be arsine. The presence of this substance in polypropylene units even at the ppb level can cause poisoning of expensive catalysts in downstream units.

Main Export Destinations:
Armenia, Iraq

Export History:
Up to 500,000 $

Founded:
1994

Application:

All the mentioned impurities are absorbed by chemical adsorbents and removed from the feed stream or output product.

This product is a final B2B consumer product.

Technical Specifications:

Among the various methods that currently exist to remove the mentioned compounds, surface absorption with low cost and a simple process is able to completely remove these compounds. All of the company's products are based on active alumina, and other salts are added to the absorbent base according to the desired impurity in the hydrocarbon streams.

Advantages:

- High quality
- High production volume

Hydrogen Sulfide Absorbent

Based on Triazine Synthesis (Tachem 3040)

Chemical Tasfyeh Co.

www.chemicaltasfyeh.com

Product Introduction:

Hydrogen sulfide adsorbents or H_2S Scavenger are a group of materials that are widely used in the oil and gas industry. These materials specifically react with hydrogen sulfide and remove it from the environment. Hydrogen sulfide causes a lot of damage to transmission lines, chimneys, or other systems. It can also react with steel and produce a thin film of its sulfide and cause corrosion. When this gas dissolves in water, it produces sulfur, which can also cause corrosion. Therefore, removing this gas is necessary and important.

Hydrogen sulfide is naturally present in crude oil and is also produced in oil refining methods such as hydrocracking or hydrolysis. But to remove it completely or to remove it from the exhaust gas of chimneys, hydrogen sulfide scavengers or absorbers can be used.

Main Export Destinations:
Armenia, Iraq

Export History:
Up to 500,000 $

Founded:
2013

Application:

Oil and gas industry

This product is a final B2B consumer product.

Technical Specifications:

The company›s product belongs to the category of water-soluble cleaners, which are the most common hydrogen sulfide cleaners and are used at temperatures below 90°. This company's product is based on triazine and is a light brown liquid product, and every 10 ppm of it is able to remove 1 ppm of H_2S.

Advantages:

Reasonable price

Adsorbent

Used in the Purification of All Types of Transformer and Turbine Oil on an Industrial Scale Based on Processed Bauxite

Niroo Namad Khorasan Co.

www.niroonamad.com

Product Introduction:

According to the definition of the IEC standard, the chemical treatment of oil is the removal of any polar and chemical contamination of the oil, including acids, aldehydes, ketones, esters, and aromatic compounds. This process improves the chemical parameters of the oil, including neutralization number (acidity), surface tension, loss coefficient and oil color.
The oil after purification must meet the criteria and conditions described in the IEC 60296 standard.

Founded:
1995

Application:

The product is the result of thermal and chemical processing of mineral bauxite, which is used for the physical and chemical adsorption of various colored impurities and sulfur-containing compounds in used oils.

This product is a final B2B consumer product.

Technical Specifications:

The adsorbent must have a high specific surface and porosity so that it can adsorb a large amount of impurities in the oil. In addition, the adsorbent should have high thermal stability so that it does not lose its structure in different stages of adsorption and regeneration and maintains its efficiency. The second aspect of the design is the adsorbent regeneration system, in which the amount of oxygen needed for regeneration should be determined according to the structure and type of pollution, and the regeneration control and monitoring system should be designed accordingly. The regeneration process starts by heating the upper part of the adsorber to the ignition temperature of the polluting compounds and then injecting air, and then this process of burning continues along the adsorber bed. Controlling the temperature profile during the regeneration process is very important, and if these conditions are inappropriate, the regeneration process will either stop, or too much heat will be produced and the adsorber will be damaged.
The adsorbent used in this product is Active Alumina, which is prepared from the natural source of bauxite. For this, an acid leaching step with hydrochloric acid is performed to remove impurities of iron (hematite), calcium and magnesium, and then two heating steps are performed. Bauxite is first transformed into boehmite and then into gamma alumina or active alumina with an average surface area of 150 cubic centimeters per gram of adsorbent. Next, this product reacts with acid and its main impurity, i.e. iron, is removed.

Advantages:

- High quality
- High production volume

International Standards or Permissions:
IEC 60296 standard

Bentonite Active Absorbent of Olefinic Compounds from Aromatic Products (Par-Tonit)

Pars Pigment and Catalyst Co.

www.ppandc.com

Product Introduction:

Bentonite as a porous material is easily and abundantly found in nature. The possibility of using it as an industrial adsorbent and catalyst always exists and this field is the subject of many researchers' discussion. Activated bentonite is used as an active absorbent soil or color removal soil in various industries due to its specific surface area and high surface acid strength. The presence of olefins in aromatic compounds (benzene, toluene, xylenes) even in very small amounts can make these valuable intermediates of organic and petrochemical synthesis lacking desirable characteristics; Because under the relatively harsh conditions required for aromatics to continue industrial reactions, olefins, which are more reactive than aromatics, contaminate catalysts or create unwanted byproducts. On the other hand, since the amount of aromatic compounds in crude oil is much less than the increasing industrial needs, these valuable compounds are synthesized by the catalytic conversion process. In such a process, some olefin is inevitably produced. Although most of it is separated by distillation and solvent extraction, small amounts of olefin remain, and the deolefinization process by means of solid beds of activated bentonite is the only economic method for its complete removal.

Founded:
1976

Application:

Bentonite as a porous material is easily and abundantly found in nature. The possibility of using it as an industrial adsorbent and catalyst always exists and this field is the subject of many researchers› discussion. Activated bentonite is used as an active absorbent soil or color removal soil in various industries due to its specific surface area and high surface acid strength. The presence of olefins in aromatic compounds (benzene, toluene, xylenes) even in very small amounts can make these valuable intermediates of organic and petrochemical synthesis lacking desirable characteristics; Because under the relatively harsh conditions required for aromatics to continue industrial reactions, olefins, which are more reactive than aromatics, contaminate catalysts or create unwanted byproducts. On the other hand, since the amount of aromatic compounds in crude oil is much less than the increasing industrial needs, these valuable compounds are synthesized by the catalytic conversion process. In such a process, some olefin is inevitably produced. Although most of it is separated by distillation and solvent extraction, small amounts of olefin remain, and the deolefinization process by means of solid beds of activated bentonite is the only economic method for its complete removal.

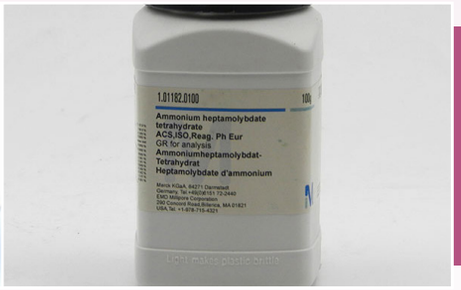
This product is a final B2B consumer product.

Technical Specifications:

The properties of bentonite include: softness, swelling, relatively good ability to mix with water, pastiness, plasticity, adhesion and absorption. For this reason, this substance has many uses, which include: production of catalytic absorbent soil, drilling mud, softener of sanitary detergent powders, preparation of casting sand, bedding soil for pets, preventing water leakage in dams and water supply channel, clarifying agents for liquids such as juices and wine, clarifiers and other sprayable substances, preparation of plant and animal poisons, fillers in industries such as papermaking, production of cleaners and detergents, and preparation of all types of ceramics and paint removal and refining of all types of oils.

Advantages:

The company›s product is acid-activated bentonite, which is used to remove olefinic compounds from aromatic fractions.



Ammonium Heptamolybdate Tetrahydrate

with High Purity Used in the Production of Oil and Gas Catalysts

Liya Chemical Co.

www.liya-chemical.com

Product Introduction:

Ammonium hepta-molybdate is a white salt with a very pale green shade, which appears completely white and shiny after grinding. Its solubility in water is very high and its density is about 2.5 grams per cubic centimeter.

Founded:
1994

Application:

Ammonium heptamolybdate is one of the molybdenum salts, which is mainly used for the production of HDS (hydrogen desulfurization) catalysts in the oil industry due to its high molybdenum content and high solubility in water. Other applications of this compound include the use in the manufacture of iron molybdate catalyst in the conversion of methanol to formaldehyde, the production of pure molybdenum trioxide (which is used in powder metallurgy and the production of special alloys, the production of molybdenum powder and the production of technetium radiopharmaceuticals), the reagent for measuring ions Phosphate, arsenate, silicate and lead in solution using titration method and as part of Froehde›s reagent for the detection of narcotic drugs.

This product is a final B2B consumer product.

Technical Specifications:

The final product is prepared from the reaction of molybdenum trioxide with ammonia solution and purified by concentration and crystallization. The purity of the product is above %99.8 and it is suitable for use in the production of catalysts.

Advantages:

- High quality
- Proper production volume

Electrolyte Fluoride Salts (NaF, LiF, MgF_2, CaF_2, AlF_3 and Na_3AlF_6)
Used in Aluminum Production Process

Arya Shimi Rasa Co.

www.aryashimirasa.com

ARYA SHIMI RASA

Product Introduction:

One of the most important and economic industrial methods of aluminum production is the Hall-Heroult process. In this method, alumina is used as a raw material. This material, along with other additives, is reduced to molten aluminum metal inside the electrolyte solution and using electric current at high temperatures (about 900 to 1000 °C). Then the molten aluminum is presented through cold molding for further use. One of the main problems related to the production and electrolysis of aluminum in the Hall-Heroult process is the high melting temperature of alumina. The actual melting temperature of this material is 2000 °C. Various additives are used to reduce the melting temperature to 900 °C and thus reduce energy consumption and production costs.

Founded:
2004

Application:

These salts cause the melting temperature of aluminum to decrease in the process of producing this material electrochemically.

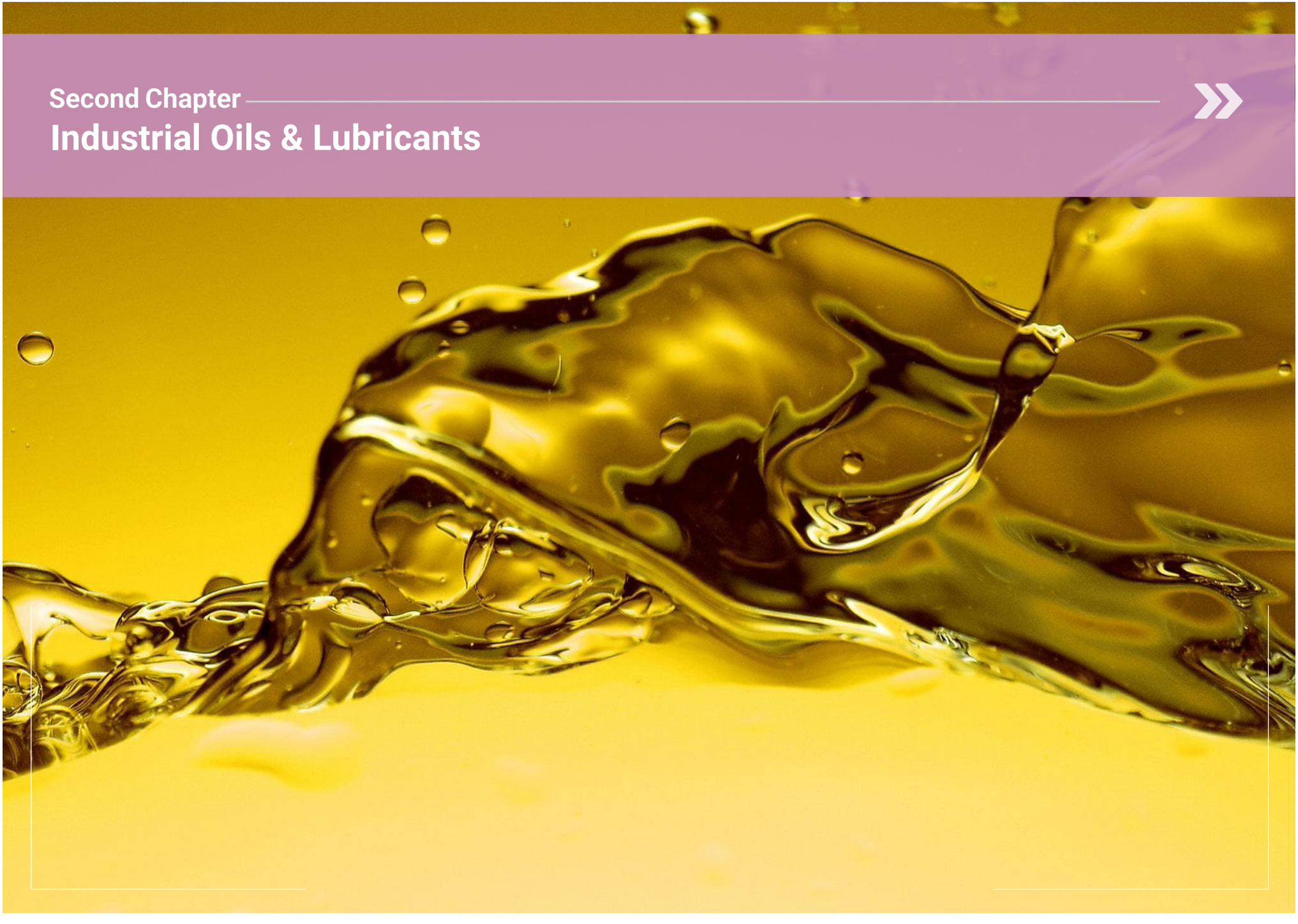
This product is a final B2B consumer product.

Technical Specifications:

Electrolytic additives in the above process are aluminum fluoride, cryolite, calcium fluoride, lithium fluoride, sodium fluoride and magnesium fluoride. Basically, all these products are the result of the reaction of oxides (mostly magnesium), hydroxides (mostly aluminum) or carbonates (lithium, calcium, sodium) of the mentioned metals with hydrofluoric acid. All mentioned salts must be of high purity so that they don't cause any disturbance in the aluminum production process.

Second Chapter

Industrial Oils & Lubricants



2nd CHAPTER

Industrial Oils & Lubricants

Green Rubber Process Oil in Three Grades Gr-15, Gr-20, Gr-40

Milad Pars Oil Co.

www.miladparsoil.com

Product Introduction:

In the tire and rubber industry, process oils are used to create rolling resistance, thermal resistance, and ease of processability. These oils were usually the output of the process units of oil factories and the result of purification by furfurals, whose polyaromatic content is very high and causes cancer. With the establishment of new standards, the amount of polyaromatic compounds in these oils should reach below 3 ppm. The product is an oil cut whose polyaromatic compounds are below 10 ppm (about 7 ppm).

Application:

This oil is used in the tire production process.

Founded:
2015

This product is a final B2B consumer product.

Technical Specifications:

In the production of this product, the focus is on the selectivity and separation of polycyclic compounds based on the molecular structure of the feed. Due to the fact that the process is completely selective and the feed is selected as lube cut, which has the appropriate molecular composition and basic structure, it is possible to obtain a suitable product with the desired properties only by separating the desired compounds and not involving other useful molecules in the oil. There are also aromatic, paraffinic and naphthenic hydrocarbon compounds in the structure of lube cut. In the solvent extraction process, it is tried to separate all aromatics affected by the liquid-liquid extraction method from the paraffin tissue according to the type of solvent. By changing the physical parameters such as temperature or the ratio of solvent to feed, selectivity conditions can be improved. The properties of one of the company›s product grades are mentioned below:

Viscosity @100°c	40C.St
Viscosity @40°c	1400C.St
A.P	120°C
F.P.T	170°C
DN @15°c	0.97gr/cm^3
PCA	0.3% <

Advantages:

- High production volume
- Reasonable price

International Standards or Permissions:

Test type	Test method	**Test type**	Test method
Viscosity	ASTM-D445	**Elemental analysis**	ASTM D-7740
Viscosity index	ASTM- D2270	**TBN, TAN**	ASTM D-664
Density	ASTM D-1298	**Flash point**	ASTM D-92
Ash content	ASTM D-482	**Aniline point**	ASTM D-611
PONA hydrocarbon content	ASTM D3238	**Light's refraction**	ASTM D-1747

Mineral Based Grease other than Bentonite
Including Silicone and W1000

Asia Juleh Co.

www.asiajuleh.com

Product Introduction:

Grease, according to the definition of the American Materials Testing Association (ASTM), is a semi-solid or solid combination of petroleum derivatives, a soap or a combination of soaps and a suitable filler that has a high viscosity and is produced for a specific type of lubrication.

Application:

Polyurea greases are prepared by thickening mineral oil or synthetic oil with organic compounds containing polyurea groups in the molecule. Polyurea thickeners are different from soap-based metal (calcium, sodium, lithium) thickeners and do not contain any metals. Typically, their operating temperature range is higher than greases based on metal soaps. Due to the nature of polyurea, they have better anti-oxidation and anti-abrasion properties. Their other advantages are: pumpability, oxidation resistance, mechanical stability, colloidal stability and water washing, high temperature and load tolerance. Polyurea grease has very good wear resistance and prevents direct contact with the surface of the teeth, so it can effectively extend the service life of the device.

Main Export Destinations:
Taiwan

Export History:
Up to 500,000 $

Founded:
1993

This product is a final B2B consumer product.

Technical Specifications:

Grease components include the following three parts:

- **Base oil**

Most of the greases produced from mineral oil are derived from petroleum. These oils provide satisfactory performance in many industrial applications due to their ability to work at high or low temperatures. It should be noted that synthetic oils are also used for special applications.

- **Thickener**

A thickener is a substance that, in combination with the base oil, produces a solid semiconductor structure. Often, the type of thickener used in metal-based greases is called metallic soap. This soap contains lithium, aluminum, clay, polyurea, sodium and calcium. Nowadays, complex thickeners have gained a lot of popularity in grease production due to their higher temperature tolerance and higher load tolerance. The most common complex grease is based on lithium, which is known as lithium grease. These types of greases are made with a combination of ordinary lithium soap and low molecular weight organic acid as a thickening agent. Non soap thickener is essential for use in high temperature environments. Bentonite and silica are two examples of soap-free thickeners that do not melt at high temperatures. Although the thickener is able to withstand high temperature, but because the base oil oxidizes quickly at high temperature, exposure of this thickener to high temperature for a long time will be associated with unfavorable results.

- **Additives**

Grease additives are used with the purpose of improving and increasing desirable properties, reducing undesirable properties or creating new properties in grease. The most common grease additives are used to prevent oxidation, prevent rust and reduce friction.

Advantages:

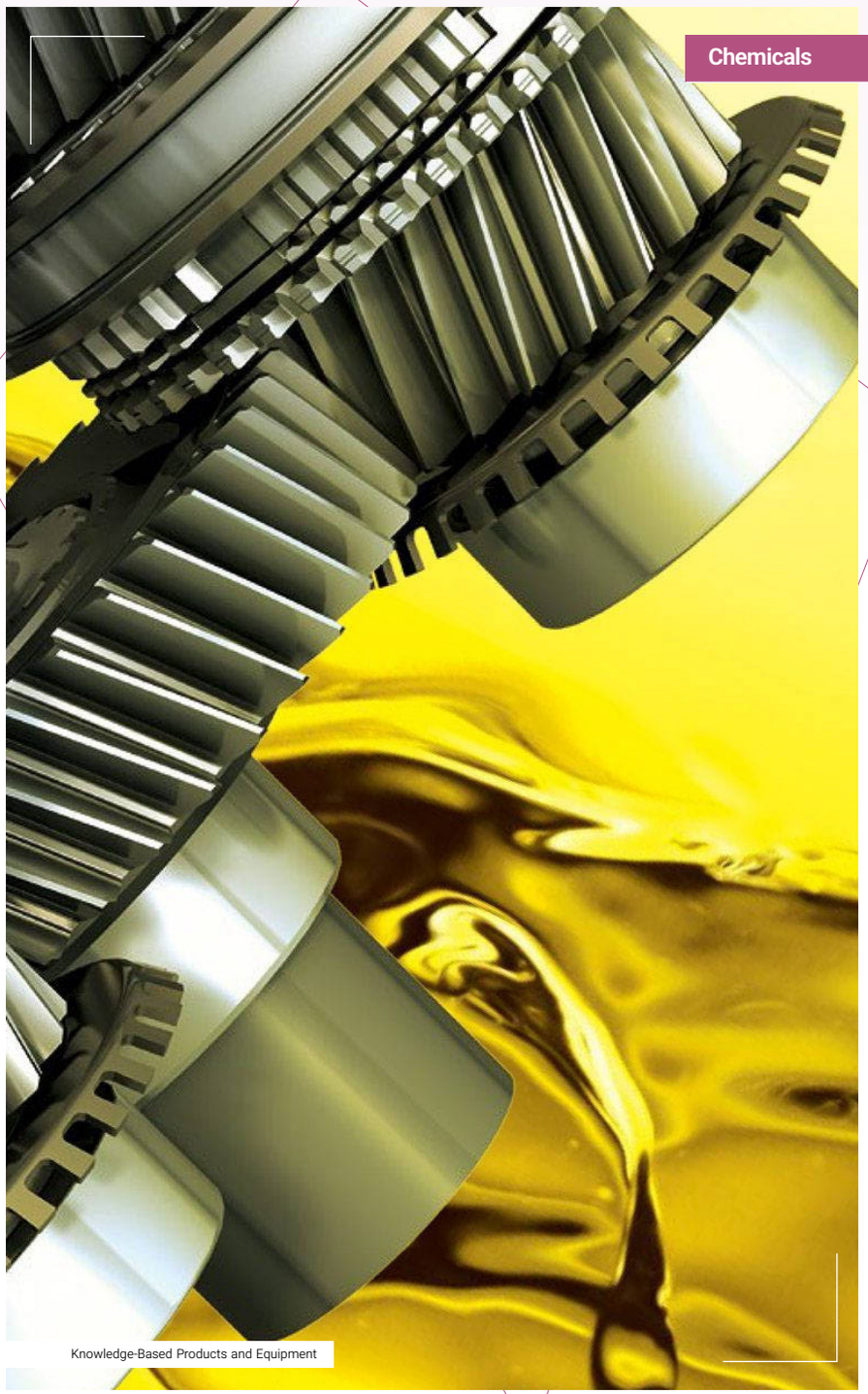
- High Quality
- Customizable
- Reasonable price

The specifications of the greases produced by the company are as follows:

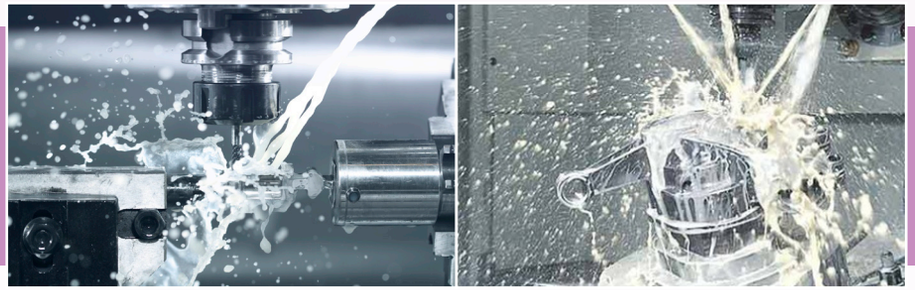
grade	Base oil	Thickener	Kinematic Viscosity at 40°C cSt ASTM D445	Dropping point °C ASTM D 2265	Cone Penetration Worked at 25°C ASTM D 217
I.P. Grease PU EP(1-2)-V460	Mineral oil	Di- urea	460	<260	290-320
I.P.Grease PU R2-V115	Mineral oil	Poly- urea	115	<260	265-295
I.P.Grease PU EP1-V100	Mineral oil	Poly- urea	100	<260	310-340
I.P.Grease PU R2-V110	Mineral oil	Poly- urea	110	<260	265-295
I.P. S.Grease PU-GM152	Synthetic Oil/ PAO	Poly- urea	150	<260	265-295
I.P. Syn Grease PU EP2– V80	Synthetic Oil/ PAO	Poly- urea	80	<260	265-295

International Standards or Permissions:

Test	based on standard	Test	based on standard
Oil flash point measurement	National Standard 198	**Grease oil extraction**	National Standard 565
Dropping point	National standard 1096	**Oil failure coefficient**	ASTM D 1218
Stability of grease against washing with water	ASTM D-1298	**Oil density**	National Standard 197
(water wash out)	National Standard 3171	**Measurement of water in oil and petroleum products**	National standard 4081 and 8139
Grease cone penetration test	National Standard 1209	**Dynamic viscosity**	ASTM D 2983
Determining the pour point	National standard 201	**TBN**	National Standard 2772
Measurement of foam in oils	National Standard 196	**Determination of viscosity index**	National Standard 195
Determination of viscosity	National Standard 340	**ASTM color determination**	National Standard 203



Knowledge-Based Products and Equipment



Emulsifying Oils (Antimicrobial)

Used for Machining of Parts

Kimiagaran Behzeest Co.

www.behzeest.com

Product Introduction:

In many industries, emulsions of organic substances in water, such as oils, waxes, and solvents, are used for various processes. Among these industries, we can mention metal turning, textile, tanning, etc. However, oil and water emulsions are an ideal place for microbial growth, and for this reason, they spoil in a short time and lose their functional properties. The increase of the microbial population, especially in anaerobic conditions, causes the degradation of emulsions, the creation of odors, the reduction of pH, and the separation of oil and water. Heavy growth of fungi leads to clogging of components, such as fluid transfer pipes, and may also have harmful effects on workers' health. It should be noted that the amount of degradation caused by microorganisms depends on factors such as the type, population, physical condition of the system such as temperature, cleanliness, type of water used and the age of the emulsion.

Founded:

1998

Application:

These materials have been developed mainly in the machining of metal parts to lubricate the machining process.

This product is a final B2B consumer product.

Technical Specifications:

The presented product is an emulsifiable oil with a paraffin base and biological technology, which is designed and produced for machining parts with ferrous and non-ferrous alloys. The general idea of this method is to use a suitable substrate and selective growth of a less harmful microorganism species in the emulsion environment as the dominant species. For this purpose, a harmless type of aerobic bacteria is added to the product from the beginning, so that it does not allow them to grow by competing with the fungi.

Advantages:

- High quality
- Reasonable price
- Exclusive production

International Standards or Permissions:

US PATENT

Emulsion Oil for Cold Rolling Mill of Steel Sheet in Three Types

Single, Double and Five Row

Beh Arian Sanat Isfahan Co.

www.beharian.com

Product Introduction:

Cold rolling mill oils are special lubricants that are used to control the friction between the rollers and the sheet, as well as remove the heat generated in the cold rolling process of the sheet. These products are usually a mixture of synthetic hydrocarbons and additives. They are used in the form of emulsion and they facilitate the reduction of the thickness of the sheet and reduce the forces required for the rolling process. Excellent lubrication quality, super cleanliness of the sheet surface due to the washing nature of the emulsion, uniform and stable rolling, increasing the speed of the rolling process and the production rate, complete evaporation in the annealing process, cleaning the rolling unit chamber, and reducing the friction of the roller are some of the features of this product.

Founded:
2005

Application:

Used as lubricant in cold rolling mill process

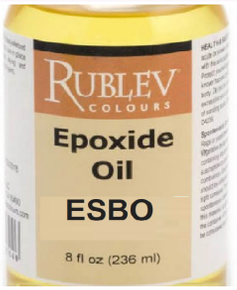
This product is a final B2B consumer product.

Technical Specifications:

The most important challenge in the process of reducing the thickness of the sheet is the high heat caused by the movement and sliding of the molecules on each other.
The quality of the resulting product is a function of oil polarity, particle size in the emulsion, its uniform distribution, the layer deposited during the process, thermal and chemical stability, and optimizing the process to achieve desired qualities is one of the most important challenges of producing a high-quality product.

Advantages:

- High production volume
- Approval from the country›s steel companies



Epoxidized Soybean Oil

Baspar Lia Chemical Co.

www.basparlia.com

BASPAR CHEMICAL Co.

Product Introduction:

To produce this product, the epoxidation process must be done. In terms of kinetic engineering, this reaction is considered one of the complex processes on an industrial scale, and it is in great need of control. This process has many complications, some of which are: precise and sensitive temperature control, control and regulation of reaction mixing, raw material control (saponification value, iodide number and color), biphasic reaction, sewage management and epoxy instability under acidic conditions.

Main Export Destinations:
Turkey, Armeni

Export History:
Up to 500,000 $

Founded:
2017

Application:

Due to its low thermal resistance, PVC requires various additives for its plasticity. The product under review is oily and light yellow in color and is used as a softener and stabilizer for PVC resin. This product is also used in the production of house paints. Vegetable oils are sustainable, renewable and biodegradable materials that have replaced petrochemicals in some applications. Soybean oils contain high amounts of fatty acids that can be converted into epoxy fatty acids.

This product is a final B2B consumer product.

Technical Specifications:

The reaction is carried out by oxygenated water and in the presence of a transfer agent such as acetic acid or formic acid, we get a peroxide. Peracid is highly active and explosive. Reaction control and reproducibility are very important with this product. Speed control is done by controlling cooling and material addition rate, and preventing monomer aggregation with a precise temperature range. From the technical specifications of the product, the acid number is a maximum of 1 mgKOH/g, the viscosity is 500 mpas, the oxirene number is at least 6-7%, the iodine number is a maximum of 3, and the density is close to one.

Advantages:

- Good quality
- High production volume

Polyisobutylene Succinimide Dispersant Additive

Used in Engine Oil

Atlas LUB Co.

Product Introduction:

Dispersants are used as one of the essential additives in the lubricant industry. These compounds have the task of cleaning the engine body, so there is no contamination on metal surfaces. This contamination on metal surfaces creates an acidic environment and severely reduces the quality of engine oil or any other lubricant. Dispersants keep these contaminants, which may be caused by the thermal degradation of the lubricant or the decomposition of additives, or other cases, in a suspended and so-called dispersed form in the lubricant space. When the oil is changed, these contaminants are removed along with the oil. One of the reasons for the darkening of the engine oil after consumption is this, which indicates the excellent quality of the oil because it has been able to keep the pollution suspended in it. One of the most well-known dispersants is polyisobutylene succinimide.

Founded:
2016

Application:

Dispersants include two heads: a polar head and a non-polar head (soluble in oil). The polar heads of the dispersants attack and surround the desired pollution and by forming a ring, they keep the pollution suspended in the oil and prevent it from connecting with the metal body of the engine.

This product is a final B2B consumer product.

Technical Specifications:

The properties of the company›s two product grades are written below:

Properties	Chain length	Vis 100 ˚C	Nitrogen	Flash point	TBN mg KOH/g
Product 484	2300-2400	330-380	-0/1 2/1	170°C	**30-15**
Product 463	1200-1300	130-180	-2/1 4/1	170°C	**30-15**

Advantages:

- High Quality
- Selling to large oil companies

Soluble Solid and Gel Oils for Metalworking

Kimia Farayand Naghsh Jahan Co.

www.kfnco.ir

Product Introduction:

Machining operations are divided into two major categories: metal forming operations and metal cutting operations. According to the type of operation, various oils or fluids can be used, which are usually introduced with names such as cutting oil, stretching oil, and soapy water. Machining lubricants are divided into three categories according to the type of operation and conditions of the part and tool: pure oils, emulsifying oils, and soluble gel and solid oils.
Gel-soluble and solid oils are similar to liquid-soluble oils in many ways, and they all dissolve in water. Their difference is that these oils are solid or semi-solid and are used for machining processes. The optimal performance of solid soluble oils is as follows: the lubricant stays on the part and melts with the heat from machining and performs cooling and lubrication.

Founded:
2009

Application:

Some examples of the applications of solid and gel soluble oils are in internal threading and drilling.

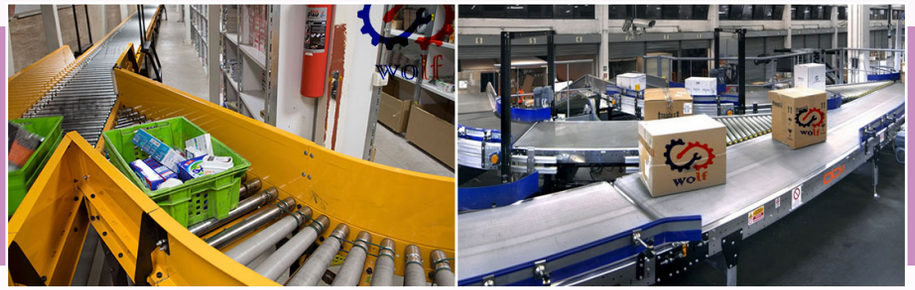
This product is a final B2B consumer product.

Technical Specifications:

The introduced product has many components that should be optimized according to the final performance of the product. The company quality controls its product with viscosity, pour point, density, sulfated ash, flash point, corrosion and acidity parameters.

Advantages:

- Different grades of products
- High production volume



Food Industry Conveyor Lubricant

Pak Coshesh Kar Co.

www.pck-ir.com

Product Introduction:

Conveyor lubricant is used to reduce friction between the conveyor belt and containers to enable traffic flow and maintain production efficiency. The lubricant must have proper slipperiness so that the movement of the dishes is well controlled and prevent the dishes from falling.

Founded:
1999

Application:

It is used to lubricate the conveyor belt to control the movement of containers on it.

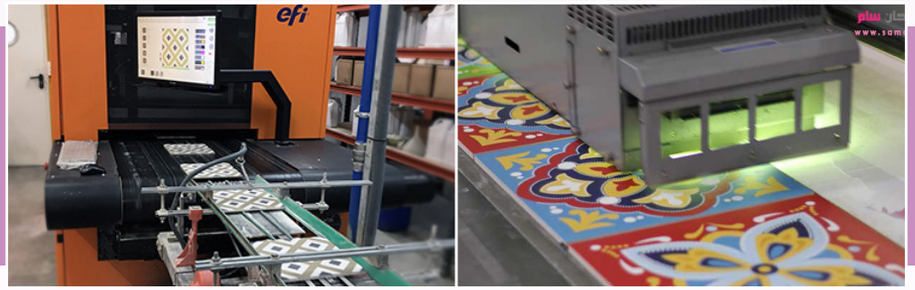
This product is a final B2B consumer product.

Technical Specifications:

Lubricant is used in dry, semi-dry and aqueous (wet) form. The type of lubricant used depends on the type of conveyor, its speed and the type of packaging (PET, glass, tetrapack). The important considerations regarding this product are: controlling the type and percentage of antifoam in the formulation due to the lack of sediment in the conveyor spray nozzles, the creation of controlled foam or the lack of stable foam production.

Advantages:

High quality at a competitive price



Special Lithographic Oil

Arista Seram Co.

www.aristaceram.com

Product Introduction:

One of the effects applied to printing in the tile and ceramic industry is designs applied to the surface using sugar powders. These powders have millimeter dimension and a ceramic base, and contain ferrite compounds. These powders must be applied on the surface, and as a result, during the firing stage of the tile (according to the type of firing), tactiled designs are created on the surface of the tile. The application of this powder on the surface is generally by distributing these particles in a carrier, and performing under a cascade method.

Founded:
2013

This product is a final B2B consumer product.

Technical Specifications:

This product actually contains powdered sugar. The characteristics that this carrier should have are oiliness and stickiness. Also, this product should have a suitable volatility and at the same time, it should not have a negative effect on the glaze. The sugar grains should be suspended for 60 minutes. The important part of this process is the low viscosity of the carrier, which is about 25 centi-poise.
The main ingredients of this carrier are water, which use different alcohols such as ethanol, propanol and methanol to create the required volatility.

Advantages:

- Low price in comparison with other similar samples
- High production volume

Additive Package of Hydraulic Oils

Hamgam Sanat Sadr Sepahan Co.

www.sadrsepahan.com

Product Introduction:

Today, all lubricants, whether they are mineral-based or synthetic, need other chemical substances (additives) that can fulfill the desired properties in order to have proper and optimal performance. These synthetic chemicals, which are often organic or organometallic materials, while giving new properties to the lubricant, can strengthen some of the properties in the lubricant and prevent some undesirable phenomena from occurring.

Founded:
2010

Application:

The hydraulic oil additive package is a package containing important and necessary additives in the base oil used in the relevant device. These compounds are mixed with different types of base oil in a specific ratio and they are used to: transfer power and heat, minimize wear and friction resulting from the movement of parts, protect the system against corrosion and increase the life of the device.

This product is a final B2B consumer product.

Technical Specifications:

In fact, hydraulic oil plays the role of transmitting power in a system, and if this oil has a problem, this task is not done well and the system faces disruption or stoppage. Actually, the additive package provides the necessary properties for the performance of a high-performance hydraulic fluid and the desired final properties.

The most important functions of a hydraulic oil are:

1. Power transfer
2. Minimizing friction
3. Protection of system components against corrosion
4. Can be used in a wide temperature range and good viscosity behavior
5. Increasing the shelf-life of the device

Advantages:

High production volume

Sulfone Oil (KS218)

Zhav Kimia Co.

www.zhavkimia.com

Product Introduction:

This product is used to produce steel for the central core of the welding wire and to create a tension system in the center of the metal wire.

This product is a final B2B consumer product.

Technical Specifications:

- The product is a type of sulfone oil that is supplied as a light brown viscous liquid. The pH of the product is around 9.6 and it is available in 60-100 kg packages.

Advantages:

- High quality
- Proper production volume

Founded:
1998

Knowledge-Based Products and Equipment

Summer Agricultural Emulsifier Oil

Abgineh Shimi AzerbaiJan Co.

www.abginehshimi.com

Product Introduction:

The oils available today are winter grade petroleum emulsifying oils used in agriculture. These oils in doses higher than 0.5% during the plant's life season cause plant burn; On the other hand, the minimum effective dose to get rid of plant pests without using poison, according to the recommendations of FAO and EPA, is above 1% and in some cases around 2.5%. Meanwhile, the emulsifiers used in emulsifying oils in the country are mainly based on ethoxylated nonylphenyls, which, if used on agricultural products, can have significant risks for humans due to the possible residue on the product. The presented product can face these challenges.

Main Export Destinations:
Iraq

Export History:
Up to 500,000 $

Founded:
1998

Application:

Used in the agricultural industry to repel plant pests.

This product is a final B2B consumer product.

Technical Specifications:

The company`s product is one of the iso-recycled oil fractions, which is sulfonated to remove harmful substances for plants and then emulsified in water with suitable emulsifiers.

Advantages:

Can be used in organic products, does not burn the plant for high consumption doses, can be used in summer, reasonable price

International Standards or Permissions:
ASTM-D86, ASTM-D1160

Polyurethane Mold Release Wax (POLYBON)

Polymer Bonyan Aria Co.

www.polybon.ir

Product Introduction:

The production process of polyurethane foams is by injecting materials into the mold, and separating wax acts as an important component in the final stage of polyurethane foam production. This process is such that after the completion of the curin process and the growth of the foam inside the desired mold, the separating wax comes into action and the desired foam can be easily separated from the surface of the mold even with a very low thickness. In case of improper performance of the separating wax, the adhesion of the foam on the surface of the mold and the tearing of the desired foam will occur. The result is that the produced foam becomes waste, and in addition, it is no longer possible to recycle it. The surface of the mold must also be cleaned for the next production, which causes the production line to stop and waste a lot of time.

Main Export Destinations:
Turkey, Indonesia, Vietnam

Export History:
Up to 500,000 $

Founded:
2015

Application:

Separating wax plays an essential role in polyurethane foam production industries, among which we can mention: car insulation foam production industries, car seats, and home and office furniture production industries.

This product is a final B2B consumer product.

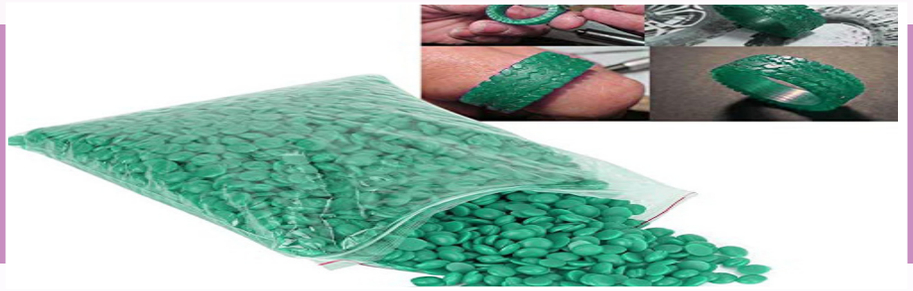
Technical Specifications:

The final product of the company is a dispersion in solvent-based media (both water-based and solvent-based) that is applied on the surface of the mold. This product forms a very thin film (Thin Film) with a nanometer thickness on the surface of the mold, which causes the separation of the polyurethane foam after the curing process and the complete growth of the foam.

Appearance	Milky liquid dispersion
Carrier	Petroleum Distillates
Density, g/cm^3	0.75 - 0.80
Solid Content (% by weight)	3-15
Flash Point (°C)	≥ 24
Drying Time (Sec)	240

Advantages:

High quality at a competitive price



Investment Casting Wax (POLYCAST)

Polymer Bonyan Aria Co.

www.polybon.ir

Product Introduction:

In the production of metal parts, there is a type of casting called Investment Casting, which is a precise process for making parts with high complexity, and it is not possible to make them with other methods such as turning. The advantages of this casting method are: the possibility of making complex volumes and parts, curves with negative angles, precise parts with very high dimensional accuracy and extremely smooth surfaces. In this method, a type of wax is used, which is called investment casting wax, and it is one of the main pillars for making the ceramic mold required for use in the casting process.

Main Export Destinations:
Turkey, Indonesia, Vietnam

Export History:
Up to 500,000 $

Founded:
2015

Application:

It is used in various industries such as jewelry making, military industries, automobile industries, making turbine blades. Also, this product is used to separate the pieces from the casting mold.

This product is a final B2B consumer product.

Technical Specifications:

Congealing Point (°C)	79
Drop Melt Point (°C)	85
Recommended Injection Temperature (°C)	80-85
Mechanical Strength	Rigid
Filler Content (%)	40
Fluidity	Medium
Ash Content (%)	0.05
Free Linear Contraction (%)	0.5

The company›s product is produced in three grades, two of which are filled wax and one of which is unfilled wax. Due to the fact that the product should not contain any ash, polymer filler is used in the amount of about 30%. The compatibility of the filler with other components is important, and for this reason, polymers such as networked polyethylene are used. Rosin is used to improve weldability and C9 and C5 are used to control the viscosity of the final product.
The melting temperature of the product is about 80 °C and it is offered to the customer in a crushed form. The final product has these properties: a waxy shape with a low melting point, minimal dimensional change with temperature changes, suitable viscosity, low ash percentage, no deviation and twisting 24 hours after molding, suitable mechanical properties and high fracture energy in the three-point bending test, no phase separation of components in the molten state.

Advantages:

High quality at a competitive price

Epoxidized Soybean Oil

Fanavaran Sepahan Chemicals Co.

www.fscco.ir

Product Introduction:

Epoxidized vegetable oils are of great importance in chemical industries and commercial products as a renewable intermediate material with biodegradability. Vegetable oils are used as a green raw material in the production of this epoxy intermediate material. In this way, it is possible to use in chemical, polymer, paint and cosmetics industries. The epoxidation of oils in the industry is based on a set of complex reactions between oil and peracetic or performic acid. Moreover, this reaction is generally reactive in situ through controlled mixing of hydrogen peroxide with a carboxylic acid in the presence of acid catalysts.

Founded:
2014

Application:

This product is used as a softener (plasticizer) and stabilizing aid (secondary stabilizer) in soft PVC industries such as hoses, wire and cable insulation coatings, transparent PVC films, adhesives production, artificial leather industries, shoe industries, dyeing, toys, granulation, tape around the glass, leather clothes, food packaging industry, production of medical products (such as PVC medical gloves), flooring, plastic wall paper, some inks, etc. Epoxidized soybean oil is also used as a surface active substance (surfactant) in the manufacture of pharmaceuticals (especially in the synthesis of nanomedicines). In nanomaterials, epoxidized soybean oil is used as a coating layer on the surface to disperse nanoparticles and keep them in a colloidal state through the mechanism of electrostatic repulsion or spatial repulsion. Another important and abundant use of epoxy soybean oil is to use it as the main intermediate in the production of polyols used in polyurethane industries.

This product is a final B2B consumer product.

Technical Specifications:

To produce this product, the epoxidation process must be done. In terms of kinetic engineering on an industrial scale, this reaction is considered one of the complex processes and needs to be controlled. Accurate and sensitive temperature control, control and regulation of reaction mixing, raw material control (soap number and iodide number and color), biphasic reaction, waste management, instability of epoxy in acidic conditions are among the complexities of the product production process. For example, if the soap number is high, it will play the role of emulsifier, which causes mixing of water and oil phase, which is not desirable. The reaction is carried out by hydrogen peroxide, which turns into a peroxide in the presence of a carrier such as acetic acid or formic acid. Peroxide is very active and highly explosive. Reaction control and repeatability are important considerations for this product.

Advantages:

- Possibility of customization
- Reasonable price

Lubricant for Powder Coatings

Jav Afzooneh Avar Co.

www.javafzooneh.com

Product Introduction:

Powder coatings are pigments and additives dispersed in a film-forming binder (resin and curing agent) that are produced as fine powders. Such powders are sprayed on the desired surfaces with an electrostatic gun. The powder particles are charged in the gun and form a thin sticky layer on the desired surface. Then, after passing through a furnace and under the effect of heat, the powder particles are melted and after creating adhesion and transverse band, they provide a hard, durable and insoluble coating.

Founded:
2017

Application:

This product is used as one of the essential and basic materials in the additive group of powder paint industry. In all powder paints with a smooth surface, 1 to 1.2 weight percent of the paint must be used. The main task of the product is to create a completely smooth surface in the paint and prevent holes and agglomeration in it.

This product is a final B2B consumer product.

Technical Specifications:

The common method for making powder paints is the method of mixing raw material melt in an extruder. Many additives are used in the preparation of powder paints, including charge controllers, flatting agents, leveling agents, degassing agents, and lubricants.

Product specifications include:

1. White micronized solid powder with a maximum of 15% of particles above 1 mm
2. Impact density: range of 590 to 640 g/liter
3. Volume density: range of 420 to 470 grams per liter
4. The percentage of volatile substances: one and a half percen

Advantages:

High quality

Soluble Oils (Cooler) Synthetic Base (Zr-1001)

with a Dosage of 1% and a Stability of More than One Year

Zist Ravankar Pooya Co.

www.zistravankar.com

Product Introduction:

Soluble oils, coolants or soapy water are actually oils that can be mixed with water and are used for lubrication and cooling processes by forming an emulsion of oil in water and creating soapy conditions. In all machining operations such as turning, milling, drilling, cutting, the heat caused by the friction of the tool and the workpiece causes them to be destroyed. This problem can be avoided to a great extent by using cooling and soapy fluids.

Founded:
2019

Application:

This product is used to adapt or connect polar compounds such as glass fibers, calcium carbonate, talc, wood powder, aluminum, etc. to non-polar compounds and polymers (such as polyethylene or polypropylene).

This product is a final B2B consumer product.

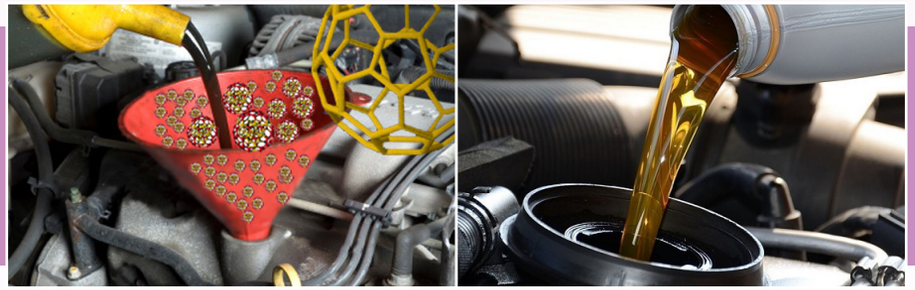
Technical Specifications:

Industrial lubricant solutions must have several important features:

- Have a high flash point and thermal tolerance, be able to absorb and dissipate the high heat of metalworking operations (cutting, drilling, etc.) well so that there is no problem for the part and it does not evaporate or catch fire. Also, at low and sometimes negative temperatures, the product should not freeze and lose its properties.
- Have high stability against biological spoilage through different microorganisms, bacteria, fungi, etc. Otherwise, there will be a bad smell in the environment and a decrease in product efficiency.
- have high stability against two phases and losing the stability of their emulsion. One of the reasons for the transformation into two phases is biological corruption.
- Do not cause the destruction of metalworking equipment such as rust, corrosion and clogging (jamming) of the device and have the ability to mix with water of different degrees of hardness.
- Creating a strong interface leads to improvement of mechanical properties such as impact and tensile strength and improvement of adhesion.
- Formulations of industrial lubricants are usually based on vegetable or mineral oils emulsified in water through ionic and non-ionic emulsifiers. To solve the problem of corruption and corrosion, biocides such as benzalkonium chloride and anti-corrosion compounds such as zinc compounds are used in the formulation, respectively.

Advantages:

- Reduced dosage
- Reasonable price



Motor Oil Based on Diamond Nanoparticles

Pardis Shimi Bakhtar Co.

www.olckanano.com

Product Introduction:

Oil containing diamond nanoparticles is obtained from the combination of base oil, common oil additives and diamond nano solution. The use of this product reduces the friction in the engine, which in addition to reducing the consumption of parts, increases the efficiency, power and acceleration of the engine. In addition, the use of this oil in engines will reduce fuel consumption and also reduce engine pollution.

Founded:
2001

Application:

This product is used as car engine oil. By changing the properties of this product, it can also be used as an industrial oil.

This product is a final B2B consumer product.

Technical Specifications:

Adding nanodiamonds does not cause any changes in the physical and chemical properties of the oil (viscosity, ignition temperature, etc.); Rather, we see the effects of these nanoparticles in the performance of oil in the engine. Assume the inner wall of the cylinder of a car that is in contact with the piston: only the space between them is filled with engine oil to reduce the friction and facilitate the movement of the two relative to each other, but on these contact surfaces, cracks or scratches It is very narrow which cannot be avoided. These thin grooves cannot be removed with any device and the surface can be polished. Since nanoparticles are very small (3 to 6 nanometers), they create a coating and a resistant film layer on the surfaces, and over time, they smooth and polish the surface and reduce the friction coefficient, and as a result, the engine works more smoothly. In this way, fuel consumption and energy loss are reduced and the speed and acceleration of the car increases. In order to prove that, the friction coefficient reduction test has been done. Also, samples of parts covered by gear oil and their radiographic images were taken.

Advantages:

- High production volume
- Reasonable price

Green Oil Green RPO (Rubber Processing Oil)

Produced through Normal RPO Processing (TDAE)

Kavir Shargh Sepahan Oil Refining Co.

Product Introduction:

This product is used in the formulation of all kinds of car tires and industrial tires. Commonly used oils contain polycyclic aromatic compounds (PCA) and these compounds are carcinogenic and very dangerous for human health. Green oil product is produced by normal RPO processing and by extracting harmful substances from RPO.

Since 2010, European countries, North America, Korea and Japan have decided to create a standard for process oil, based on which it was decided that normal process oil will be changed to “green” or environmentally friendly process oil. Today, in European, American, Korean and Japanese countries, the use of normal tires and normal process oils is obsolete, and a product that does not have the label of green tires is not allowed to be used in these countries.

Founded:
2018

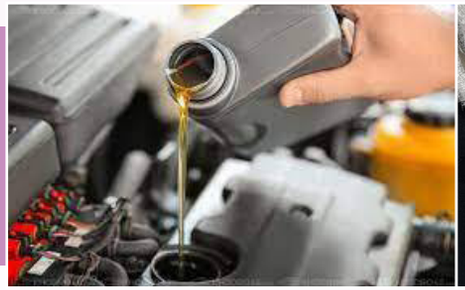
Application:

This oil is used as an additive in rubber production processing

This product is a final B2B consumer product.

Technical Specifications:

The design of the extraction process and system, the amount of solvent, the type of solvent and the stoichiometric ratio of oil/solvent, different temperature diagrams are some of the technical complications in the extraction process. Other challenges of this process include the step of separating the main oil from the solvent with an efficiency of 30-40%, separating the solvent from water and polycyclic aromatic compounds, and breaking the azeotropic phase of the alcoholic solvent with water with a specific temperature and pressure profile (from 100° to 60°) and the recycling of solvent.



Super Alkaline Calcium Sulfonate Oil

Petro Konar Sanat Co.

Product Introduction:

One of the most important indicators in the production of motor oil is the alkalinity number (Total Base Number), for which TBN booster additives are used. This substance with the chemical name of super alkaline calcium sulfonate is used in gasoline and diesel engines to neutralize the acids created by combustion. Among the other advantages of this material, we can mention its cleaning property and preventing the formation of deposits on the engine surfaces by it. This product can be added in all mineral oils, semi synthetic and full synthetic. In the production of diesel and gasoline oils, an average of 3% of this product is added to the base oil.

Founded:
2019

Application:

This product is used to adapt or connect polar compounds such as glass fibers, calcium carbonate, talc, wood powder, aluminum, etc. and non-polar compounds and polymers (such as polyethylene or polypropylene).

This product is a final B2B consumer product.

Technical Specifications:

The production process includes two stages of sulfonation of alkylbenzene and then the production of calcium sulfonate micelles.

The most important determining parameters for this additive	
Calcium content	> %14
Sulfur content	> %1.2
Flash point	At least 180°C
Water content	> %0.5
TBN number	Depending on the product grade, between 300 and 400

Advantages:

Good quality

Zinc Dialkyl Dithiophosphate

Afzoon Ravan Sazan Mihan Co.

www.alcchem.com

Product Introduction:

Lubricating oils used in car and hydraulic engines need different additives to adjust properties; These additions sometimes reach more than 10 items. One of the most important additives used in engines is zinc dialkyl dithiophosphate (ZDDP) additive, which gives several important properties to the oil, including wear resistance, oxidation resistance, corrosion resistance, and increased thermal resistance.

Founded:
2014

Application:

This substance is used as an additive in engine oil. Its weight percentage is between 1 and 3% and its most important characteristic and application is as anti-wear.

This product is a final B2B consumer product.

Technical Specifications:

Density	Viscosity	Flash point	pH	Water content
1.12 g/cm3	4 mm^2/s	133.9 °C	6	0.16% V/m

Advantages:

High production volume

Third Chapter

Chemical Additives

3rd CHAPTER

Chemical Additives

Sections

Types of Surfactants Used in Detergents

Padideh Shimi Jam Co.

www.padidehshimi.com

Product Introduction:

Surfactants or surface active substances are substances that, by adding them to a liquid, reduce its surface tension and increase its brittleness. Surfactants are divided into three categories: cationic, anionic and nonionic.

Main Export Destinations:
Azerbaijan, Armenia, Tajikistan, Turkmenistan, Iraq, Afghanistan

Export History:
Between 500,000 - 1,000,000 $

Founded:
2009

Application:

Surfactants are mainly used in the detergent industry, but they have other uses in the oil and gas industry, lubricants and chemicals used in the agricultural industry.

This product is a final B2B consumer product.

Technical Specifications:

Surfactant name	Surfactant type	pH	Appearance characteristics
Coco amido propyl betaine	Amphoteric	-4.5 5.5	Pale yellow liquid
Cocamidopropyl hydroxysultaine	Amphoteric	6.5-8	Colorless liquid
Tallow esterquat	Amphoteric	2-3.5	Yellow paste

Advantages:

- Reasonable price
- High production volume

Emulsifiers Used in Food Industry

Pars Behbood Asia Co.

www.parsbehbood.com

Product Introduction:

Emulsifier compounds are of the subcategory of surface active agents or surfactants. In other words, emulsifiers are fatty substances that have dual properties of lipophilic and hydrophilic. The surface tension between two phases that are normally immiscible is reduced by emulsifier. Therefore, two liquids will be able to form an emulsion. An emulsifier contains water-soluble and oil-soluble parts. When an emulsifier is added to a mixture of water and oil, it is placed on the contact surface between the two. This is done in such a way that the hydrophilic part is inclined towards water and the lipophilic part is inclined towards oil.

Founded:
2006

Application:

In the food industry, including modifiers of bread and pastry, yeast dough, sweets and chocolates, cakes and cookies, meat products and etc.

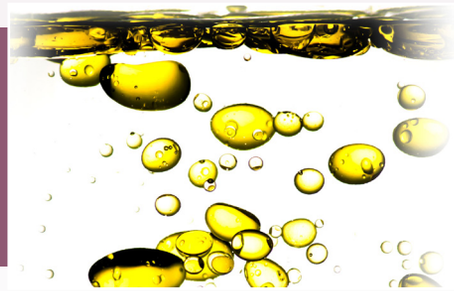
This product is a final B2B consumer product.

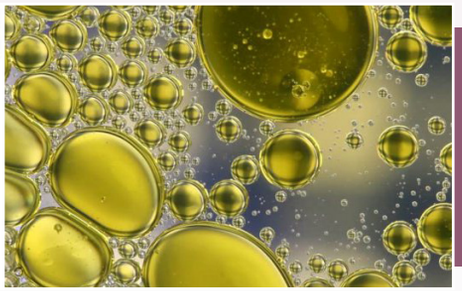
Technical Specifications:

The general raw materials used in the synthesis of emulsifiers are the same and include glycerol radical (monoglyceride, diglyceride, etc.), acid radical (tartaric acid, acetic anhydride, acetic acid, lactic acid), catalyst and anti-agglomeration agent. According to the use of emulsifier in the final product (food industry), the expected final soap number and acidic number, the type of acidifying agent, catalyst, glycerol radical are changed. Also, the process variables including temperature, time, and pressure are changed accordingly and optimized according to the considered emulsifier.

Advantages:

- Health permit
- High volume production
- Reasonable price





Demulsifier

Arad Sanat Mahan Co.

www.aradsanatmahan.com

Product Introduction:

By using several methods such as mechanical methods (including filtration, thermal treatment techniques and even membrane separation), thermal, chemical or even electrical methods, water dispersed in oil can be separated. Determining the characteristics of the emulsion is important to identify the best method to use. Among the mentioned methods, the best and most economical method is the chemical suspension process. Based on this, a suitable demulsifier with the lowest possible concentration should be used, which can completely separate the water at a low operating temperature and reduce the salt to the lowest possible level in the shortest possible time.

Application:

These materials cause the separation of water from the water/oil emulsion and prevent problems such as corrosion, difficulty in transferring oil and reducing the quality of oil.

Main Export Destinations:
China and India

Export History:
Up to 500,000 $

Founded:
2011

This product is a final B2B consumer product.

Technical Specifications:

The demulsifier breaks the water-in-oil emulsion and separates the water from the produced oil. The demulsifier, in contact with the water-in-oil emulsion, weakens the electrostatic forces of repelling water droplets and eventually causes the droplets to collect together.

This process includes the following two steps:

- **Flocculation:** tiny water droplets are connected to each other and appear in the form of clusters.
- **Coagulation:** binding of water molecules.

Solid wetting: With this process, physical separation takes place and water is placed at the bottom.

It is necessary to investigate various factors affecting the performance of demulsifiers, such as the rheology of interfacial properties, the amount of hydrophilicity and hydrophobicity, the rate of mass transfer from the demulsifier to the interface, etc. One of the characteristics of a suitable demulsifier is the maximum separation of water from crude oil with the minimum amount and concentration of demulsifier used at the lowest operating temperature and the shortest time.

Demulsifiers are a combination of different materials, including acid or base catalyzed phenol formaldehyde resins, polyols, polyamines, polyethylene imines and even epoxy resins. The main component of these materials is based on polymer or copolymers, which must be ethoxylated or propoxylated in a controlled manner before use. The product is a formulation of one or more of the aforementioned ethoxylated or propoxylated polymers along with some additives, including alkyl aryl sulfonic acids, fatty acid esters, ethers and esters of bis-phenol glycol, sodium dodecyl sulfate, etc. These additives are soluble in solvents such as xylene, heavy aromatic naphtha, isopropanol, methanol, ethylhexanol, etc. Their composition is done in certain percentages, which need to be changed according to the specifications of the oil extracted from each oil field.

Advantages:

- Customization for each oil field
- Reasonable price
- High quality

International Standards or Permissions:
ISO 9001 , ISO 4610, ISO 6743, ISO 18001

Demulsifier

Novin Chem Co.

www.novinchem.com

Product Introduction:

Due to the presence of high amounts of water, salt and other solids in crude oil, it is necessary to separate these materials from crude oil in primary extraction before refining crude oil; Because the presence of these materials, especially water, which also carries some dissolved salt with it, has led to a decline in the quality of oil in the world market and will even cause it not to be purchased if the permitted amount is not met. One of the most important problems created in case of no separation or insufficient separation of water and soluble salts from oil is the creation of severe corrosion problems of crude oil refining equipment.

Founded:
2005

Application:

DEMULSIFIERS or emulsion breakers are special chemicals that play an important and strategic role in the separation of oil-related materials. These materials overcome the water-oil emulsion and lead to the separation of water from oil.

This product is a final B2B consumer product.

Technical Specifications:

Mostly, demulsifiers are a combination of different materials including acid and/or base catalyzed phenol formaldehyde resins, polyols, polyamines, polyethyleneimines and even epoxy resins. Their main component is based on polymer or copolymers, which must be ethoxylated and/or propoxylated in a controlled manner before use. The product is a formulation of one or more ethoxylated and/or propoxylated polymers, along with some additives (including alkyl aryl sulfonic acids, fatty acid esters, bisphenol glycol ethers and esters, sodium dodecyl sulfate, etc.). This product is soluble in solvents such as xylene, heavy aromatic naphtha, isopropanol, methanol, 2-ethylhexanol, etc., which is done physically and in the combination of specific percentages that need to be changed according to the characteristics of the oil extracted from each oil field.

Advantages:

- Possibility of customization
- Good quality

Inhibitor of Hydrate Formation

Novin Chem Co.

www.novinchem.com

Product Introduction:

Different types of hydrate inhibitors have been developed based on thermodynamic and kinetic changes in the past decades. But the most important and newest hydrate inhibitor compounds that have been considered change the kinetics of hydrate formation instead of changing the thermodynamic conditions of hydrate formation. This is done by slowing down the process of nucleation and crystal growth.
The most famous kinetic inhibitors are polyvinylpyrrolidone, polyvinylcaprolactam, polymethylvinyllactamide, polyvinylvalerolactam, polyacrylopyrrolidine, a combination of these polymers and a number of quaternary ammonium compounds. These compounds prevent the formation of gas hydrates in gas transmission lines with low temperature and high pressure and eliminate the risk of pipeline clogging by ice plugs.

Founded:
2005

Application:

These products are kinetic inhibitors of gas hydrate formation and prevent the formation of clathrate hydrates in the cold seasons of the year (low temperature and high pressure) in gas transmission pipelines. In addition, it prevents gas and condensate transmission pipelines from being blocked, eliminates the risk of pipeline clogging by ice plugs, and thus ensures the stability of the production flow.

This product is a final B2B consumer product.

Technical Specifications:

The company's product is based on polyvinyl caprolactam (PVCap) and amine compounds. But the company has also developed the copolymer PVCap with N-vinyl pyrrolidone (PVP) and also the synthesis of PVP polymers with n-butyl acrylate monomers (in order to adjust the solubility of the product in water and reduce the dosage). Polymer composition or copolymers prevent clathrate formation and nucleation, while amine compounds prevent clathrate growth. After the synthesis of polymer or copolymers, other additives including solvents, amine compounds, etc. are added to it to adjust properties such as density, viscosity, environmental stability, etc., and thus the final product is produced.

Advantages:

- High production volume
- Use of biodegradable polymers
- Good quality

Kinetic Inhibitor to Prevent Hydrate Formation

Based on Phenol Formaldehyde Resin

Arad Sanat Mahan Co.

www.aradsanatmahan.com

Product Introduction:

Natural gas and crude oil are naturally in contact with water in underground reservoirs. Water molecules form a quasi-network structure due to having strong hydrogen bonds by creating holes. In the formed crystal network, gas molecules (guests) with molecular diameters smaller than the diameter of the holes are trapped inside the shelves created by water molecules (host) and by hydrogen bonds between them and due to the interaction between guest and host molecules, the created structure becomes stable. This formed crystalline substance, which resembles ice, is known as gas hydrate. Hydrate formation is a serious and essential factor in clogging process equipment and pipes in oil extraction, production operations in the petrochemical industry and refineries, as well as in gas transmission lines under low temperature and high pressure conditions. In the past decades, various types of hydrate inhibitors have been developed based on thermodynamic and kinetic changes.

Main Export Destinations:
China and India

Export History:
Up to 500,000 $

Founded:
2011

Application:

As an inhibitor of hydrate formation in oil and gas pipelines

This product is a final B2B consumer product.

Technical Specifications:

The most important and newest hydrate inhibitor compounds that have been considered, instead of changing the thermodynamic conditions of hydrate formation, change the kinetics of its formation by slowing down the nucleation process and crystal growth. The most famous kinetic inhibitors are polyvinylpyrrolidone, polyvinylcaprolactam, polymethylvinyllactamide, polyvinylvalerolactam, polyacrylopyrrolidine, a combination of these polymers and a number of quaternary ammonium compounds.

But the company's product is developed on the basis of Resol and Novolac resin, which brings advantages: production costs are reduced, and this material has the characteristic of being biodegradable.

The three main stages of making this kinetic inhibitor are:

1. Synthesis section of phenol-formaldehyde resin (Resol and Novalak resin)
2. Ethoxylation of resin
3. Final formulation and use of suitable solvents as carriers

The consumption of this substance is about 1 to 2 percent in pipelines.

Advantages:

- Customization
- High production volume
- Remarkable quality
- Lower usage percentage than other samples

International Standards or Permissions:
ISO 9001 , ISO 4610, ISO 6743, ISO 18001

Corrosion Inhibitor

Novin Chem Co.

www.novinchem.com

Product Introduction:

CO_2 and H_2S gases and chlorine and cyanide impurities in oil and gas cause corrosion of pipes and equipment made of carbon steel. One of the standard methods to prevent internal corrosion of equipment and pipes made of carbon steel is the injection of a corrosion inhibitor.

Founded:
2005

Application:

Almost all organic molecules used as corrosion inhibitors in oil and gas are highly polar and mainly nitrogen-based (such as amines, amides, imidazolines and quaternary ammonium salts). Nitrogen-based organic inhibitors such as polyamidoamines and imidazolines and their salts have been successfully used in this type of applications. The mechanism of action of this type of material is their surface absorption on the metal surface and creation of an interface layer. The ability of these compounds to create cations causes their strong surface adsorption on negatively charged surfaces such as metals and turns hydrophilic surfaces into hydrophobic ones. With this action, cathodic and anodic reactions are prevented. This product is used to prevent corrosion in tubing and wellhead equipment of oil wells and oil and gas fluid transmission pipelines, transmission and process systems related to sour water (such as stripping towers), process equipment (such as the overhead of distillation towers in the oil and gas, refining and petrochemical industries, which have a high H_2S content (25% or higher)).

This product is a final B2B consumer product.

Technical Specifications:

The company's product is based on amide salts of fatty acids. Some important features that the product should have is that it should not create foaming and emulsion phenomenon, it should have high thermal stability and very low pour point and high flash point at the same time. The anti-corrosion power of the product must also be very high so that it passes the complex standards of the oil industry.

Advantages:

Having passed the quality verification tests in the upstream drilling of the oil industry

Water-Based Anti-Corrosion Additive

Midea Chemi Co.

www.mideachemi.com

Product Introduction:

Anticorrosives are chemical substances that react with the surface of metals or are placed as a single layer around the surface subject to corrosion to partially protect the surface of the metal from the agents that cause corrosion of metals. Anticorrosives often protect the surface of metals by adsorbing themselves on the surface of metals and forming a film.
They also reduce the corrosion process by increasing the behavior of anodic and cathodic polarization, reducing the transfer or diffusion of ions on the surface of metals and increasing the electrical resistance on the surface of metals.
The systems used by the industry include metals such as iron, zinc, aluminum, steel, copper, etc. These metals may be used in various systems such as boilers, engine cooling systems, etc. In addition, these systems are in contact with acids such as hydrochloric acid, sulfuric acid, phosphoric acid, etc., or with water that has a lot of solutes and salt, all of which cause corrosion of these metals. Among them, there are chemical compounds that reduce the severity of corrosion, and each of these compounds is used with specific percentages for specific metals. Some of these compounds include: tripolyphosphates, imidazolines, sodium nitrite and mercaptobenzotriazole, borax, etc. Depending on the type of system used, corrosion inhibitors are divided into three categories: soluble in water, soluble in oil, and three-phase corrosion inhibitors.

Founded:
2014

Application:

This product is a water-based anti-corrosion fluid. It is used as an anti-corrosion additive in oil, gas and petrochemical industries, power plant industries and treatment plants and other related industries (in general, industries where the presence and transfer of water leads to corrosion of their metal parts).

This product is a final B2B consumer product.

Technical Specifications:

- **Density:** 1.3 to 1.7 (depending on the concentration of the active substance in the water solvent)
- **Appearance:** clear, yellowish to syrupy (depending on pH)
- pH: 8 to 9 for a %1 solution in water
- **Solubility:** It is completely soluble in water in any ratio. It can be dissolved in alcoholic solvents with specific proportions.
- **Amount of foaming:** No (Low-foaming)
- The amount of toxic compounds containing chlorine, phosphorus and nitrite: None
- These compounds are water-based and no organic solvents are used.
- (mineral-oil free) is compatible with the environment (Biodegradable) operating temperature range (from the ambient temperature to the boiling point of water)
- **Usage concentration:** based on the type of usage and the pH value, its concentration varies

International Standards or Permissions:
ASTM D-2247 and ASTM D665

Simultaneous Inhibitor of the Formation of Calcium, Strontium and Barium Sediments Inside the Well and Oil Transfer Pipes

Novin Chem Co.

www.novinchem.com

Product Introduction:

To remove sediment and clogging, strong chelating and complexing materials are used with these cations to prevent the formation of insoluble carbonate and sulfate deposits. The formation of sediments of these compounds, such as calcium carbonate, calcium sulfate, barium sulfate, and strontium sulfate, causes clogging of pipes, reduction of oil production, increase of extraction and transportation costs, and as a result, heavy costs are imposed in order to remove this sediment. Phosphonate base compounds as well as polymers and copolymers based on acrylic acid are the most important and common compounds that have strong phosphonic and carboxylic acid chelating agents in their structure and form strong and soluble complexes with the desired cations and as a result prevent the formation of insoluble sediments of these compounds. Although some sulfonate compounds are also used as copolymers in this field.

Founded:
2005

Application:

SCALE INHIBITOR is used to prevent the formation of calcium, barium and strontium sediments (carbonate and sulfate of these metals) etc. in oil wells and oil fluid transfer pipelines.

This product is a final B2B consumer product.

Technical Specifications:

Product efficiency in low doses of 25-50 PPM has been proven to prevent the formation of calcium, barium and strontium deposits.

Advantages:

Having passed the quality verification tests in the upstream drilling of the oil industry

Seawater Sedimentation Inhibitor Based on the Synthesis of Triethanolamine Tris (Dihydrogen Phosphate) (Tachem 4060)

Chemical Tasfyeh Co.

www.chemicaltasfyeh.com

Product Introduction:

Considering that most oil facilities are built by the sea, it is very important to use anti-sediment materials before seawater enters the facility due to the high level of salts and chemicals. Also, the formation of organic and inorganic sediments during crude oil production has always been one of the most important and common problems in the oil industry. This challenge can lead to interruption of flow and occurrence of various problems in various stages of production up to oil storage tanks and export. Since the first step in the occurrence of this problem is the formation of sediment inside the column of oil wells, therefore, chemical methods and continuous injection of anti-sediment chemicals with special efficiency can play a vital role in preventing corrosion caused by sedimentation and reducing its huge costs.

Main Export Destinations:
Armenia and Iraq

Export History:
Up to 500,000 $

Founded:
2013

Application:

Seawater antisediments with their excellent range of desirable properties and unique efficiency, as an antisediment agent for high hardness waters, especially sea water, prevent the formation of calcium sulfate, calcium carbonate, barium sulfate, and strontium sulfate deposits. Another application of seawater anti-sediment is the use of these compounds as anti-scalant materials for waters with a high concentration of calcium carbonate, calcium sulfate, barium sulfate, strontium sulfate, and bicarbonate ions in the reverse osmosis (RO) system. This work is applied before the water enters the membranes as a suitable pre-treatment system based on the quality of the feed water, and its purpose is to maintain the efficiency of industrial water treatment devices and increase the life of the membranes. Also, due to their relatively high stability in environments with high alkalinity, sea water anti-sedimentation is suitable for the preparation of household and industrial detergent products, which require the use of materials with strong performance.

This product is a final B2B consumer product.

Technical Specifications:

The product has been developed on the basis of phosphate ester called triethanolamine tris (dihydrogen phosphate) and is supplied as 50% soluble in water.

Advantages:

Proper production volume

Anti-Sediment, Sediment-Remover and Anti-Corrosion Solutions

Abrizan Industrial Research Co.

www.mitreh.com

Product Introduction:

Converters are devices that are used to transfer heat. These devices have different types and are widely used in light and heavy industries, high-rise buildings (engine houses), refineries and petrochemicals, etc. The fluid flowing in the converters is water in most cases.

One of the problems of using water in exchangers is sedimentation, corrosiveness and the possibility of growth of microorganisms and macro-organisms. It is very important to solve these problems in order to reduce energy consumption, increase productivity and reduce depreciation in facilities. Sediments formed on working surfaces; They increase resistance to heat transfer between two fluids and cause corrosion in systems. In order to increase the productivity and efficiency of the system and to prevent the formation of sediments on the walls of the converters, the surfaces of the facilities and pipelines, as well as to reduce the rate of electrochemical corrosion and general corrosion in the facilities, anti-sediment and anti-corrosion materials should be used. Before that, the formed sediments should be removed without damaging the facilities.

Founded:

2009

Application:

Sediment remover, anti-sediment and anti-corrosion solutions with special performance dissolve the sediments formed on the surfaces in water and prevent the formation of new sediment and corrosion in the facilities. All three functions are performed simultaneously with the operation of the system and without the need to stop the process, which is one of the most important features of this solution. This solution has different types and is used in systems such as cooling towers, condensers, boilers, chillers and absorptions, engine houses, packages and all systems that use water for heat transfer.

This product is a final B2B consumer product.

Technical Specifications:

All the functional properties of the product have been carried out by organizations such as Oil Industry Research Institute, Shiraz University and many large industrial consumers such as Continental Plateau Oil, Khuzestan - Dez District Hydropower Plant Repair Company and Behnoosh Iran Company.

Advantages:

- High Quality
- Certificated by international standards
- High production volume

International Standards or Permissions:

- OHSAS 18001:2007 international standard
- ISO 9001:2008 TUV/ICB international standard
- ISO 14001:2004 TUV/ICB international standard certificate
- BS EN ISO 14001:20015 certificate
- BS OHSAS 18001:2007 certificate
- INTEGRATED MANAGEMENT SYS certificate
- Unicert Qualitat certificate
- IMQ certificate

Anti-Sediment Solution

Bualisina Water Development Co.

www.bct.co.ir

شیمیای بوعلی سینا

Product Introduction:

When water is used as a thermal fluid, the solutes and hardness in the water are separated due to the temperature shock and deposited on the surfaces. These sediments are one of the most important factors of erosion and corrosion in thermal and refrigeration facilities. The presence of sediments, along with the erosion and corrosion of the equipment, cause the heat exchange not to take place and wastes a significant amount of energy and reduces the efficiency of the facilities. The effect of sedimentation on energy loss is a topic that has received more attention today, so that the annual cost of energy loss due to sedimentation is estimated at 45 billion dollars in all countries, which is equivalent to 2.0% of the net production of the whole world.

Founded:
2016

Application:

Anti-sediment materials prevent the sediments from sticking together and make the particles suspended and dispersed in the circulating water so that they can be removed from the system through the water itself.

This product is a final B2B consumer product.

Technical Specifications:

The main chemical compounds that cause deposits in water pipes, boilers, cooling systems, and reverse osmosis water purification devices are: calcium carbonate, calcium sulfate, barium carbonate, barium sulfate, magnesium carbonate, silica, and calcium phosphate. Common anti-sediment agents include formulations of synthetic resins, mostly acrylate bases, polyphosphates (sodium tripolyphosphate), soluble chelating agents (EDTA), and sometimes biocides to control microbial contamination.

Antifouling materials with anionic functional groups (phosphate or carboxylate) create electrostatic interactions with metal ions of barium, calcium and magnesium, etc. or with fine particles of insoluble salts of these ions. This interaction is based on three prevention mechanisms: threshold, crystal deformation and dispersion, and the result is preventing the formation of these mineral deposits.

The company's products are based on a synthetic terpolymer including acrylamide, maleic anhydride and AMPS. Another grade includes acrylic acid copolymer and AMPS. After synthesis, the mentioned resins are formulated with other components to achieve the desired final properties.

Advantages:

- Confirmation from domestic authorities
- Good performance

Fire Extinguishing Foam

Pars Atashbas Industries Co.

www.atashbas.com

Product Introduction:

Various products have been developed by companies for extinguishing different types of fires. One of these products is firefighting foams. Foam is a stable mass of small bubbles that is less dense than oil or water and tends to cover a horizontal surface. This mass flows freely over the surface of the igniting liquid and forms a thick, continuous, airless coating that prevents volatile vapors from entering the air. The main component of the company's product for film formation is animal protein obtained from the hydrolysis of wool, horn or animal protein residues, which forms firefighting foam by formulation with other materials.

Main Export Destinations:
India and Turkmenistan

Export History:
Up to 500,000 $

Founded:
2008

Application:

Generally, this product is used to extinguish class B fires (hydrocarbon liquids and polar solvents).

This product is a final B2B consumer product.

Technical Specifications:

The base of these foams consists of two main components, foaming and extinguishing, which act in two opposite directions, and it is difficult to create compatibility between them. For this purpose, types of anionic, cationic and non-ionic fluorine surfactants are used. It should be noted that the type and number of carbon chains are effective on the quenching power. In the protein foam, there was a possibility of sedimentation, and this challenge was solved by the company. This is a powerful extinguishing product that gently covers the fire and prevents the penetration of oxygen and the chain movement of fuel molecules. Due to the presence of water in this foam, the heat decreases during the fire, and due to the complete covering of the surface of the combustible material in it, oxygen is prevented from reaching the fire. The part that plays an essential role in fire extinguishing is the ability to form a resistant film layer with a suitable expansion coefficient. This product is offered in two types: natural base with high degradability in the environment or protein base structure, as well as chemical base. In the characteristics of foam, two factors SURFACE TENSION and SPREADING COEFFICIENT are considered as two important indicators: where ST < 17 and SC > 1 are desirable.

Advantages:

High production volume

Silicone-Based Anti-Foam

Bonyan Shimi Hamgam Sanat Co.

www.bonyanshimi.com

Product Introduction:

The emergence of foam in various industries is one of the factors that will create a negative and downward effect on production efficiency. The production of foam involves many problems and causes adverse effects on the related industry, and that is why the use of anti-foam is necessary. In general, foam occurs in the processes of food processing, chemical production, fermentation, textile industry, adhesive production, printing ink, paint, coating and resin, petrochemical and refinery industries in mixing, filtration, dilution, filling product containers, distillation and reflux. . The occurrence of foam in various industries reduces the efficiency of equipment and imposes high costs. For this reason, appropriate control and interventions are very important to eliminate this phenomenon. In industrial processes, foams cause serious problems. They cause defects in surface coatings and prevent efficient filling of containers and cause overflow of materials inside production tanks in various industries. In addition, the speed of chemical reactions of physical processes related to chemicals also decrease, among which we can mention a sharp drop in the efficiency of crushing processes or a change in the rheological properties of fluids.

Application:

Antifoam is used to remove foam and prevent the production of foam caused by various physical and chemical processes. Anti-foams are generally divided into three categories: oil, polymer and silicone.

This product is a final B2B consumer product.

Technical Specifications:

- This product is generally a chemical additive that is used in various industries such as paint and resin, paper making, alcohol making, etc. These materials are used in a very small amount in the formulation, but in the same small amount (below 1% and usually in the range of 0.1%), they leave a great impact on the final performance of the product. Its final function is very sensitive. Consumers of this product replace commercial products that are currently used in their production line. Therefore, this product must be able to provide not only a good performance in the customer's production line (both prevent the formation and growth of foam and prevent adverse effects such as creating unevenness of the film or stains or creating non-viable colors in the paint), but also be able to simulate the performance of an foreign reference product that has overcome these challenges.
- This product is available as an oil-in-water emulsion or an oil-in-organic solvent solution. The main components of this formulation are:
  1. **Hydrophobic agent:** This agent here is silicone oil, which is absorbed on the interface of fluid (usually water) and air and makes it unstable.
  2. **Solid particle:** this agent here is usually nano silica. After it is absorbed on the interface along with silicone oil, it destabilizes it by creating defect points on the surface and prevents the formation and growth of bubbles on the one hand, and on the other hand, it destabilizes and destroys the formed bubbles.
  3. If the product is in the form of an emulsion, an emulsifier is needed, otherwise a solvent is used. Water-based emulsion grades are used in the food industry and organic grades are used in the oil and gas and chemical industries.
- **pH:** 6-8
- **Density:** 0.85 to 0.95

Advantages:

- High quality
- Reasonable production volume
- Competitive price

Application:

Industrial soot (Black Carbon), with its unique properties, has a high position in the industries of producing pigments, masterbatches, inks and paints, especially tires and rubber.

Hard Industrial Carbon Black

Sanati Doodeh Fam Co.

www.sadaf-cb.com

This product is a final B2B consumer product.

Product Introduction:

Industrial soot with the Black Carbon brand is a valuable black material from the carbon family that is produced under controlled conditions and through a special process. This soft and fine material has a diameter of about 100 to 1000 angstroms. Black carbon or industrial soot is one of the most important types of industrial carbon in which carbon atoms are arranged in parallel and irregular layers.
Two types of soots are usually used in the tire industry. One of these two types of soots is called “hard soot” and is used to increase wear resistance in tires and is generally used in tire coatings. Another type of soot, which is called “soft soot” has the property of strengthening and increasing flexibility in the tire.

Technical Specifications:

The raw materials for the production of this material include refinery residues, coal tar, or similar oils. The product is produced under CTCE license and all the properties of the product have been measured and are within the standard range. The amount of DBP for different grades is between 90 and 120, and the amount of ash is about 1%, the amount of sulfur is about 1%, the pH is between 7 and 9, and the amount of hardness is between 10 and 40.

Advantages:

- Very high production volume
- Reasonable price

Main Export Destinations:

China, India, South Korea, South Africa, UAE, Turkey, Thailand, Taiwan, Azerbaijan, Indonesia, Sri Lanka, Bangladesh, Philippines, Qatar, Kenya, Vietnam, Syria, Afghanistan, Pakistan

Export History:

Between 50,000,000 to 100,000,000 $

Founded:

2004

Lignosulfonate Extracted from Bran and Wheat Bran

Used in Concrete and Building Material Adhesives

Ard Daran Co.

www.ard-daran.com

ARD DARAN

Product Introduction:

Lignosulfonates or sulfonated lignin are water-soluble anionic polyelectrolyte polymers. They are by-products of wood pulp production using sulfite pulping process. Most descaling in sulfite pulp involves acidic decomposition of ether bonds that connect many lignin compounds. Electrophilic carbohydrates produced during ether decomposition react with bisulfite ions (HSO_3) and give sulfonates. Depending on the used source lignosulfonates can have a very wide molecular mass range (1000-140,000).

Founded:
1994

Application:

Lignosulfonates have wide applications. These compounds are used as lubricants in the production of concrete mortar, thickeners of tile and ceramic adhesives, production of plasterboards, reducing the viscosity of mineral slurry for use in drilling mud, dispersing toxins used in pest control, paints, black carbon and other solids and liquids insoluble in water, leather tanning, dust reduction of asphalt roads, etc.

This product is a final B2B consumer product.

Technical Specifications:

The product is the result of processing bran or wheat bran and the application of the product is for use in tile and ceramic adhesives. The factor that caused the advantage of using these products over other slurry additive products is the use of different additives in the formulation of these materials to achieve the rheological goal. One of these additives, which is the most widely used additive in ready-to-mix mortars, is a modifier of rheological properties and a thickener. It is a modifier of rheological properties and a thickener. This additive creates better resistance and durability by creating a suitable concentration and workability in the lower ratio of water to cements compared to slurry compounds.

Advantages:

- High production volume
- Reasonable price

Glazing Powder

Fars Chemical Industries Co.

www.farschemical.com

Product Introduction:

Glazer is a special type of melamine formaldehyde powder used for glazing. Glazer is placed on dishes in thin layers and prevents melamine from coming into contact with food and gives shine to dishes. It can also be dissolved in water and used to stain paper. In fact, this product can be considered from the melamine-formaldehyde family with a higher crosslink density.

Main Export Destinations:

India, Turkey, Saudi Arabia, Oman, UAE, South Africa, Jordan, Egypt, Nigeria, Mozambique, Georgia, Gabon, Kenya, Cambodia, Ghana, Sri Lanka, Ivory Coast, Romania, Tanzania, Azerbaijan, Turkmenistan, Armenia, Syria, Iraq

Export History:

Between 1,000,000 - 10,000,000 $

Founded:

1987

Application:

This material is used as a coating in melamine dishes.

This product is a final B2B consumer product.

Technical Specifications:

The challenges that this product faces include: curing time, preventing cracking and chipping and creating gloss on the surface of the melamine plate.

Features	Descriptions
Appearance	White powder
Density	0.5 ± 0.05 g/cm3
pH (50% aqueous solution – at 25 °C)	7-9.5
Curing time (at 150-160 °C)	20-30 sec
Humidity	4 wt%

Advantages:

Reasonable price

Paraformaldehyde Powder

Fars Chemical Industries Co.

www.farschemical.com

Product Introduction:

Paraformaldehyde (PFA) is the smallest polyoxymethylene and formaldehyde polymerization product with a typical degree of polymerization of 8 to 100 units. Paraformaldehyde is a polyester and usually smells less than formaldehyde due to decomposition and is always made from concentrated formaldehyde solutions. Normal formaldehyde is formed by low pressure distillation of dilute formaldehyde solutions obtained in manufacturing plants. Paraformaldehyde (PFA) is the smallest polyoxymethylene and formaldehyde polymerization product with a typical degree of polymerization of 8 to 100 units. Paraformaldehyde is a polyester and usually smells less than formaldehyde due to decomposition and is always made from concentrated formaldehyde solutions. Normal formaldehyde is formed by low pressure distillation of dilute formaldehyde solutions obtained in manufacturing plants.

Main Export Destinations:

India, Turkey, Saudi Arabia, Oman, UAE, South Africa, Jordan, Egypt, Nigeria, Mozambique, Georgia, Gabon, Kenya, Cambodia, Ghana, Sri Lanka, Ivory Coast, Romania, Tanzania, Azerbaijan, Turkmenistan, Armenia, Syria, Iraq

Export History:

Between 1,000,000 - 10,000,000 $

Founded:

1987

Application:

Paraformaldehyde can be used as a substitute for formaldehyde. It is used as a disinfectant, preservative of biological samples and as a synthetic precursor for the production of phenol formaldehyde and melamine resins.

This product is a final B2B consumer product.

Technical Specifications:

Paraformaldehyde is prepared from a concentrated solution with 80-89 weight percent of formaldehyde by one of the methods presented in the following paragraph:
The first and oldest way is to solidify a concentrated formaldehyde solution in a batch in a reaction vessel. Freezing may be done in the reaction vessel itself with or without a catalyst or by pouring the contents of the reaction vessel onto the cooled surface. In another process, the concentrated solution is poured over a heated roller device that evaporates the water from the paraformaldehyde powder, resulting in a highly pure formaldehyde product. The use of kneaders (dough makers) and even the use of extruders have also been reported. In all cases, the final product must undergo a secondary drying process to obtain a product that is hard enough not to form lumps during storage and transportation. Paraformaldehyde is the concentrated form of formaldehyde with the advantage of easier transportation and greater storage stability. Paraformaldehyde with 95% formaldehyde content is supplied in the form of white powder.

Features	Descriptions
Apearance	White powder
Formaldehyde (min)	95 ± 1 wt%
Acidity (max)	200 ppm
Specific weight (at 20 °C)	1.09
pH (at 25 °C)	4.5 – 5
Ash (max)	0.01 wt%
Average mesh size	70 wt%

Advantages:

- Reasonable price
- High production volume
- High purity

Polymer Raw Materials

for Coating Steel Pipes and Cables (AD-COAT)

Polymer Pishrafteh Dana (PPD) Co.

www.polymer-pishrafteh.ir

Product Introduction:

One of the most efficient methods of coating metal pipes is the use of a three-layer polyethylene pipe coating system. These coatings consist of layers of melt-bonded epoxy, glue, and high-density polyethylene. In the method of coating metal pipes, we use a system including one layer of EBF, Epoxy Bond Fusion, one layer of intermediate glue and one layer of high density polyethylene as the final layer (Jacket Black).

Founded:

2013

Application:

These coatings are used to prevent corrosion in pipes. This product is in the form of polymer granules, which is used as the final layer in a Steel Pipe Coating system and also in cable coating. This coating system is known to be very effective in preventing corrosion in steel pipes.

This product is a final B2B consumer product.

Technical Specifications:

The formulation of this product includes 4 different components. The main parts of this product include two main components, i.e. polyethylene polymer and black masterbatch (containing 40 weight percent of carbon black). It should be noted that in the final composition of the product, the percentage of soot reaches about 2 weight percent. The melt flow index is suitable for the production of plastic film, and the mechanical and functional properties of the film, such as resistance to cracking caused by environmental stress, are about 5000.

Advantages:

High quality

International Standards or Permissions:

Melting point, oxidation time, elongation to break, density, etc. are under ISO standards.

Crude Oil Desalting Materials

Arad Sanat Mahan Co.

www.aradsanatmahan.com

Product Introduction:

The desalination process is one of the most important steps in the operating units in the crude oil processing wells and the first step in the refinery units. The crude oil extracted from the well after the separation of gases and accompanying water contains some water in the form of water-in-oil emulsion, which contains various mineral salts such as sodium, magnesium and calcium chloride.

Main Export Destinations:
China, India

Export History:
Up to 500,000 $

Founded:
2011

Application:

These materials cause the separation of water from the water/oil emulsion and prevent problems such as corrosion, difficulty in transferring oil, and reducing the quality of oil.

This product is a final B2B consumer product.

Technical Specifications:

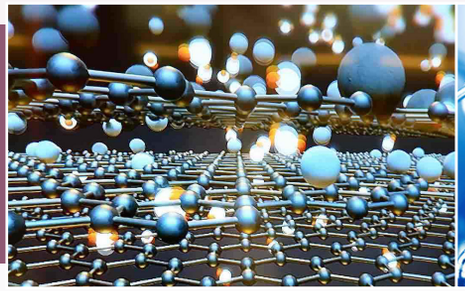
The function of these materials is such that they cause the thin membrane around the water emulsion droplets to break. In fact, demulsifiers are surface activators and neutralize the emulsifying agents of water. However, excessive injection of these materials causes the production of new emulsion materials and creates many problems in the wastewater treatment process. Therefore, accurate calculations must be done in determining the injection rate of these substances. The emulsions formed are usually not weak and cannot be neutralized by mechanical forces. Therefore, in most cases, demulsifiers must be injected into the system. These substances are insoluble in salt water and highly soluble in oil. For this reason, they can quickly move in the oil phase and reach the surface of the particles, and with this, salt water droplets stick together more easily and form larger particles.

The company's product is ethoxylated phenol formaldehyde resin. These parts are important in the quality of the final product: the polymerization of the resin with a certain molecular weight, the distribution of the certain molecular weight and its ethoxylation rate.

Advantages:

- Customization
- Reasonable price
- High quality

International Standards or Permissions:
ISO 9001, ISO 4610, ISO 6743, ISO 18001



Synthesis of Various Peroxide Initiators
for Polymerization Reactions

Arad Sanat Mahan Co.

www.aradsanatmahan.com

Product Introduction:

Peroxides are a group of organic compounds with a peroxide functional group (ROOR) in which the bond between O-O is broken under the influence of controlled agents and free radicals are formed. Organic peroxides are initiators of polymerization reactions and are highly oxidizing, unstable, dangerous and explosive substances. Due to the complex production technology, polymerization initiators are considered important and strategic raw materials of petrochemical and polymer industries and have a special position in this industry. The technical knowledge of the production of these initiators is often exclusively under the control of industrial and advanced countries of the world. Peroxide compounds should be stored in opaque containers in cool places without vibration. Heat and light accelerate chemical reactions with peroxides and should be avoided.

Main Export Destinations:
China, India

Export History:
Up to 500,000 $

Founded:
2011

Application:

They are usually used as initiators in radical polymerization reactions.

This product is a final B2B consumer product.

Technical Specifications:

These initiators are synthesized by the reaction between an organic acid, mineral acid and peroxides. In all stages of temperature control, the flow rate of raw materials, mixing speed, the percentage of raw materials, etc. are essential factors. The storage conditions of these initiators are very difficult and they are mainly kept at negative temperatures (-15°C) and sent to petrochemicals by containers equipped with cooling systems.

Advantages:

- Not using electricity
- No need for cabling and mast
- Clean and environmentally friendly energy

International Standards or Permissions:
ISO 9001 , ISO 4610, ISO 6743 & ISO 18001

UPVC Window and Door Profile Stabilizer (Based on Lead)

Hampar Co.

www.hampar.com

Product Introduction:

The structure of PVC makes this composition highly sensitive to temperature and cutting pressure, and as a result, it is easily destroyed. The destruction of PVC causes the release of hydrochloric acid gas, which will cause the catalytic effect of destruction and thus; Degradation proceeds very quickly. This process produces large amounts of HCL gas, which is corrosive and toxic. This is why thermal stabilizers are used. According to the process conditions and formulations, these stabilizers will be different. Most stabilizers contain metal elements that react with HCL and prevent further degradation.

Founded:
1989

Application:

- UPVC door and window profiles
- PVC pipes and fittings
- Cable sleevings
- Foamed PVC sheets

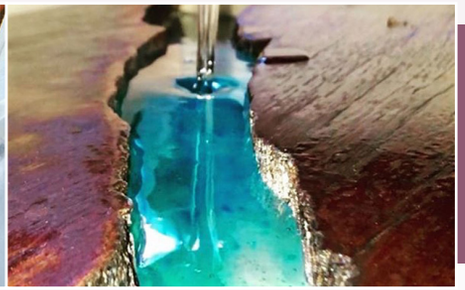
This product is a final B2B consumer product.

Technical Specifications:

Stabilizer packages include stabilizers, mineral fillers, emollients, lubricants, process aids, and special additives such as flame retardants. Stabilizing packages are used in most products to provide thermal stability and rheology behavior adjustment, and these materials should be changed according to the customer's formulation. One of the sensitive products that have the most stabilizing package components is UPVC door and window profiles. Due to long-term exposure to sunlight, this product must have a suitable environmental resistance. Also, the primary color of the profile should be suitable and in the formulations with high calcium carbonate, proper lubrication is necessary to prevent burns.

Advantages:

- Partnership with a foreign company in production
- High production volume
- Reasonable price



Anti-Sticking Agent

Zhav Kimia Co.

www.zhavkimia.com

Product Introduction:

The manufactured product is a substitute for laurate salt. In the process of styrene polymerization, to increase the mechanical strength of the polymer, polybutadiene is used to create transverse connections and produce HIPS products. Consumable polybutadiene rubber (PBR) is purchased in blocks of 20 to 50 kilos and must be ground and converted into small pieces before being added to the polymerization reactor. Because this material has a high adhesion, the smaller parts produced during grinding quickly stick together and lose their efficiency when the grinding process is applied. To solve this problem, a special type of lauric acid salt is used in the petrochemical industry, which is added to PBR during grinding and prevents the sticking of the milled rubber parts. The presented product has different bases and is prepared without the use of lauric acid.

At the global level, the only effective material used in the polybutadiene rubber (PBR) mill is the chemical potassium laurate, which, despite some problems in its use and due to its sensitivity and the possibility of disrupting the polymerization process, the manufacturing companies have not been able to find a replacement for it. This product is prepared without the use of lauric acid compounds, and after many tests, it has replaced the imported material as a new material with the firm approval of the Petrochemical Research Unit.

Founded:
1998

Application:

Used in PBR mills

This product is a final B2B consumer product.

Technical Specifications:

- Anti-sticking agent for use in the production of HIPS (polybutadiene rubber adhesion prevention)
- **Appearance:** yellow to red-brown oily liquid
- **Ionic Properties:** Mainly anionic
- **Solubility:** It dissolves well in water
- **pH:** 9.5 ± 1
- **Cloud point** < 30°C
- **Boiling point** > 90°C
- **Density:** 1.3
- **Storage conditions:** Store in a closed place at a temperature of 10 to 45 degrees Celsius and away from flammable materials, heat and flame.
- **Expiration date:** one year after production
- **Packaging:** 60 kg plastic containers

Advantages:

- Alternative to potassium laurate
- Good quality
- High production volume

Modified Two-Component Mortar Based on Latex

Sanat Bam Golestan Co.

Product Introduction:

The product is a type of concrete that, as a result of adding a styrene-butadiene emulsion latex dispersed in water, improves some properties, including compressive, tensile and bending resistance. Also, the permeability of concrete against chlorine and salt has been significantly reduced.

Founded:
2007

Application:

This mortar has technical advantages in sealing concrete resources and tanks, swimming pools, building services and water and sewage channels, as well as economic benefits in construction projects. As a result, it has been introduced as the most suitable alternative to insulation systems such as Qirguni, Izogam and white insulation.

This product is a final B2B consumer product.

Technical Specifications:

This product is a combination of cement base powder reinforced with polymer and acrylic base sealing resin. Among its capabilities, we can mention the ability to seal all concrete and cement tanks and pools with a thickness of 3 to 4 mm and without the need for auxiliary mesh fibers. In addition, the possibility of bearing pressure up to 2 bar is one of the other features of this product.

Advantages:

- No cracking
- Better workability and troweling
- lower price

Antistatic Material

Zhav Kimia Co.

www.zhavkimia.com

Product Introduction:

The manufactured product is an antistatic material that is used to neutralize electric charges in the production process of expanded polystyrene.
The use of antistatic in the drying path of EPS (expanded polystyrene) grains produced before the separating sieves is important from two perspectives:

1. Due to the presence of pentane in the system, there is a possibility of causing an explosion as a result of the electrical discharge of the charged seeds, which causes irreparable damage.
2. The electric charge of the grains disrupts the grain grading by creating larger masses and blocking the openings of the sieves.

For this purpose, the antistatic solution is sprayed on the seeds with a spray system.

Founded:
1998

Application:

This substance is used in the petrochemical industry in the production of expanded polystyrene to increase the surface stability of the produced polymer and prevent sparks and explosions.

This product is a final B2B consumer product.

Technical Specifications:

- Antistatic material for use in the production of EPS (expandable polystyrene)
- **Appearance:** yellow oily liquid with distinct alcoholic smell
- **Solubility:** It dissolves well in water
- **pH:** 1±8.5
- **Boiling point:** > 70°C
- **Density:** 1 to 1.02
- **Storage conditions:** Store in a closed place at a temperature of 10 to 30 °C and away from flammable materials, heat and flame.

Advantages:

- High quality
- Selling to domestic petrochemicals
- Lower price than foreign samples

Anti-Milkstone Deposits Detergent

Pak Coshesh Kar Co.

www.pck-ir.com

Product Introduction:

This product is formulated to be added to alkaline detergents, especially caustic soda, and by having dispersant and surfactant, it increases the washing power and causes the separation of stains and milk stone in dairy factories.

Founded:
1999

Application:

The product is used to remove milk stone in washing tanks, pasteurizers, operators and pipelines and fittings in the dairy industry.

This product is a final B2B consumer product.

Technical Specifications:

Traditionally, soda is used for CIP (Cleaning In Place) washing, which is unable to separate the milk stone from the surfaces and reduces the work efficiency in the milk powder process. The presence of these sediments increases fuel and energy consumption and causes faster depreciation of equipment. By adding this product to caustic soda, the time interval between two CIP increases and the CIP time decreases, and therefore the milk powder production efficiency increases. Energy consumption is reduced due to the removal of milk powder sediments and the increase of the heat transfer coefficient, and the consumption of acid and water is saved in other stages of CIP.
Due to the fact that milk sediments contain proteins and calcium in addition to fat, therefore, special detergents are required that can synergistically break down all these compounds and somehow remove them from the surfaces in a short period of time.

Advantages:

- Reasonable price
- High Quality
- High production volume

Primer Wax Based on Modified Bitumen (Metal and Concrete)

Herba Research and Production Group

www.herbaco.ir

Product Introduction:

The modified bitumen-based primer wax is a type of insulation and mineral polymer coating that is used both on concrete and cement surfaces and on all metals (healthy and rusty) without sandblasting.
When this product is applied on metal, with its penetrating power and high adhesion, it buries all corrosions and pleats and reaches the microscopic level of the metal. At this stage after waxing, it permanently protects its underlying surfaces against decay, rust and all corrosive factors. Applying this product on concrete makes the desired surface waxed and protected against moisture, corrosion and penetrating agents in general.

Application:

The applications of this product are in these cases: insulation and waterproofing of shear walls, retaining walls and shotcrete, decks, concrete bridge foundations and bases, concrete foundations and floors, tunnel walls and subway shafts, transmission pipes and burial and non-burial concrete tanks, septic tanks, beams and the base of electric towers

This product is a final B2B consumer product.

Technical Specifications:

Technical properties of the product	
Fam (color)	Black
Base	Bitumen
Resin type	Polymer
Gloss	Semi-glossy
Number of components	single component
Density	0.9±0.05 g/cm^3

To modify bitumen, polymer compounds such as styrene block copolymers (SBS, SEBS) or polyolefinic compounds such as (APP, etc.) are used to improve rheological properties and improve adhesion.

Advantages:

High quality, production in high volumes, approval of the Road, Housing & Urban Development Research Center and being in the vendor list of the oil company and the Ministry of Energy.

PVD Hard Nitride Coatings on Industrial Parts

Ara Advanced Hard Coatings Co.

www.hardcoating.ir

Product Introduction:

Machining has been the main process of shaping engineering parts throughout history. For each machining process, durable and long-lasting, efficient and reliable tools are needed. Cutting tools are one of the main parts in the machining process. In the competitive environment of the industry, tools should move towards increased life, increased quality and better efficiency, and less need for lubrication. In this regard, there are fundamental challenges: for example, in order to prevent the breakage of a tool and reduce abrasion, it is necessary for the tool to be flexible, while flexibility is the opposite of hardness. Usually, a material is either very hard or has high flexibility, and having these two properties at the same time is a contradictory desire. The solution to this problem is to protect tools made of flexible materials (such as steel) by using hard coatings. As a result, you can have a tool that is resistant to breakage while also taking care of it against abrasion and mild adhesions.

One of the methods of applying coatings with high hardness and in nanometer and micrometer thicknesses is the Arc-PVD method. In this method, the voltage generated 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 (target) and creates a very high current density, which causes the cathode to evaporate and turn it into ionized vapor. Ionized steam reacts with gases entering the chamber (oxygen, nitrogen, etc.) and deposits a thin ceramic layer on the surface of the target piece.

Founded:

2014

Application:

These coatings can be applied on different types of sub-layers. These items include: types of extrusion molds, deep drawing, rolling, wire drawing, punching, forging, diecasting and plastic injection, drilling tools, gearing, finger milling, punching, internal threading , plastic cutting, paper and plastic shredding, medical cutting and surgery and cutting of wood, piston ring, gauges, pins and other parts under abrasion can be applied.

Among the general properties of this category of coatings, we can mention the increase of hardness, reduction of friction coefficient and surface roughness, very good adhesion to the substrate and improvement of corrosion resistance of the coating.

This product is a final B2B consumer product.

Technical Specifications:

Due to the low chemical reactivity of these coatings with the work pieces, the tool is protected against welding and creating a sticky surface. The result of all these effects is that cutting with a coated tool increases the cutting speed and increases the life of the cutting parts. Hard protective coatings are usually nitrides of intermediate metals, which have high hardness, high resistance to abrasion and oxidation.

Advantages:

High production number

International Standards or Permissions:

- ISO 26443
- ISO 14577

Synthesis of Water-Based Organosiloxane Waterproofing Polymers

Paya Shimi Hoomaan Co.

www.payashimi.com

Product Introduction:

Coatings and super-hydrophobic surfaces in general are a class of smart coatings that are gaining an important position in the field of technology and industry. These surfaces have very little friction with water and this causes water to flow over them with minimal pressure difference. In addition, the water droplets roll instead of sliding on their surface. The rolling of water droplets on the surface causes the pollution on the surface to be removed from the surface along with them.

Founded:
2016

Application:

These surfaces have special properties such as: self-cleaning, anti-friction, anti-ice and snow, waterproof and anti-corrosion. This product makes surfaces hydrophobic.

This product is a final B2B consumer product.

Technical Specifications:

A criterion to distinguish between hydrophilic and hydrophobic surfaces is generally the water contact angle (WCA). Accordingly, surfaces with WCA greater than 90° are called hydrophobic and those with WCA greater than 150° are called superhydrophobic.

In order for a surface to be able to provide high hydrophobicity, it must:

1. have suitable surface chemistry and in fact very low surface energy
2. have a surface texture with high roughness and on a nano scale.

The product under review is the synthesis of an organosiloxane resin emulsifiable in water, which is applied on cement and brick surfaces or on the surface of textiles and protects them from water penetration and wetting. This product is available in different types and in some types it also provides super hydrophobic behavior which makes the surface self-cleaning.

Advantages:

- Different grades
- Good quality

Biodiesel on an Industrial Scale

Takestan Sanat Gharb Co.

www.taakteek.co

Product Introduction:

This product is the result of the esterification reaction of vegetable or animal fats of food waste with methanol in the presence of basic catalyst (KOH).
The advantages of biodiesel compared to diesel fuel are: safe transportation, availability, renewablity, higher cetane number (48-75), less sulfur and aromatic content, higher combustion temperature and more natural degradability. With the production of biodiesel from waste oil sources, the costs related to urban wastewater treatment and replacement of the sewage system are greatly reduced.

Founded:

2008

Application:

This product is used as a substitute for diesel fuel or as an additive to diesel engines

This product is a final B2B consumer product.

Technical Specifications:

In this product, an oil refining step is performed before the reaction. The reaction is carried out in a single step at a temperature below 100°C and a pressure of 1 bar, and finally it is converted into two phases of glycerin and biodiesel. Then, after separating the two phases, routine purification operations (filtration, washing and dyeing) are performed.

Advantages:

High quality at a competitive price

International Standards or Permissions:

All performance analyzes are obtained by the company

Safe Flammable Materials

Zagroti Co.

www.zagroti.ir

Product Introduction:

Mankind is facing many problems in the field of lighting fire and lighting coal. In the past, they used oils made from the skin and fat of animals to light the fire, both in industrial use and in recreational use and home gas stoves. With the passage of time and human access to fossil fuels, first crude oil and bitumen and then kerosene, gasoline and petrol replaced oils.

These types of fuels cause serious damage to the environment as well as human health due to the creation of greenhouse gases and soot particles resulting from incomplete burning, and they are also part of non-renewable fuels and contain volatile and polluting compounds, which are very dangerous and unsafe.

Alcoholic compounds are used in the formulations of the compounds available in the market, such as fire-causing gels and alcohol tablets, which are biologically carcinogenic, and also due to the volatile nature of alcohol, their shelf life is short and they will gradually lose their properties. Also, the cost of their preparation is high and it takes a lot of time to light the coals. Among their other disadvantages, we can mention low efficiency and creating a low flame, and as a result, not lighting the fire well, as well as emitting polluting gases.

Founded:
2015

Application:

This product is used to make fire.

This product is a final B2B consumer product.

Technical Specifications:

The company's product is in three forms: cube, spray and liquid. One of the innovations of this product is its complete safety, so that this product creates fire only by pouring it on wood or charcoal and does not create fire on other surfaces. Its spray form is also non-explosive and does not explode in any way, even in the furnace and oven.

Advantages:

- Higher flame temperature than similar products
- Reasonable price
- Variety of products

Polymer Mulch

Zist Polymer Imen Asia Co.

Product Introduction:

Polymer mulch is a copolymer that is mainly prepared as a solution. Compared to oil mulches, it has advantages such as lower price, fewer environmental problems, and providing the conditions for plant growth. Therefore, it has good conditions to replace petroleum mulches. Among its other features, it is biodegradable and destroyed by sunlight within 2 to 5 years.

Founded:
2014

Application:

This product covers desert areas to prevent sand movement and desertification.

This product is a final B2B consumer product.

Technical Specifications:

The company's specialists manufacture products by studying each region's soil and considering soil type, porosity, pH, etc. One advantage of the product over other competitors is the possibility of using it in salty fields. The base of the company's product is acrylic acid, which has also used block copolymers to make the mulch softer.

Advantages:

- Obtaining valid domestic approvals
- Possibility of customization
- Reasonable price

Polymer Packing

Used in BOP (BLOW OUT PREVENTER) of Oil Wells

Baspar Kimya Co.

www.basparkimya.com

Product Introduction:

In the drilling of oil wells, it is very important to prevent the fluids inside the well from splashing out. There are flammable, toxic and corrosive fluids with very high pressure inside the oil well, which can be thrown out of the well and cause very harmful accidents. For this reason, a structure called blow out preventer or BOP is installed at the head of the well to prevent this risk. These BOPs are classified into two categories: Ram and Annular.

Founded:
1996

Application:

To prevent splashing of fluids inside the well

This product is a final B2B consumer product.

Technical Specifications:

In the Ram type BOP, an activator must be injected behind the P-seal to maintain its function. This material must be able to be injected into the back of the p-seal in some way and perform a leak stop. This leak stop factor is called plastic packing. This mixture should have several features:

1. It should not be destroyed under the stress caused by friction with the drill bit.
2. It should not change its dimensions and properties when exposed to gases and fluids in the well.
3. Hydrocarbon and water absorption should be very small.
4. It should create low friction with the drill bit.
5. It must be able to inject under temperature and pressure.
6. It should maintain its elastomeric property at the injection site to realize leakage prevention.
7. It should perform properly at high temperature of the well.

In order to provide suitable mechanical properties, the company has introduced Kevlar fibers and carbon fibers in the structure. In addition, in order to provide lubrication behavior and low friction, graphite, fluorine, polymer and molybdenum sulfide have been used as fillers. In order to achieve waterproof and oil-proof properties at the same time, fluoroelastomer has been used as the main base. Fluoropolymers have both hydrophobic and oleophobic properties.

Advantages:

Proper quality

Two-Component Polymeric Adhesive for Repairing

with Very High Abrasion and Corrosion Resistance Based on Novalac Epoxy Resin

Baspar Kimya Co.

www.basparkimya.com

Product Introduction:

In the oil, gas and petrochemical industries, as well as in the power industry, we face challenges such as erosion caused by abrasion and corrosion due to performing various chemical processes at high temperatures and pressures. These damages can lead to holes and holes in the part, which completely disrupt the performance of the part. In these cases, efforts will be made as much as possible to repair the damaged part and eliminate the need to replace it.

Founded:
1996

Application:

The repair of large parts used in the power plant and oil and gas industries that have undergone corrosion is done with the help of this product.

This product is a final B2B consumer product.

Technical Specifications:

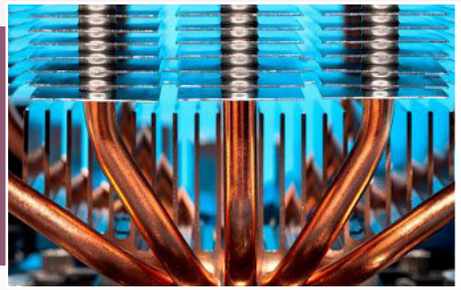
This product must have many features and in the course of its development, many challenges must be overcome, among which the following can be mentioned:

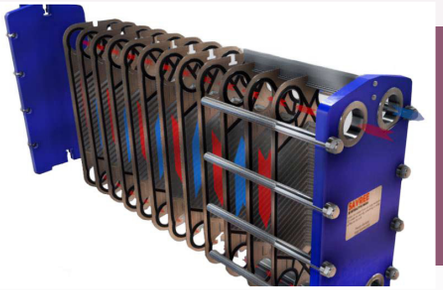
1. This material must be able to have a high resistance to abrasion and corrosion.
2. The product must have a high hardness.
3. Adhesion of this mixture to the metal substrate should be suitable.
4. It is expected that the coefficient of thermal expansion of this product will be close to that of the underlying metal.
5. If necessary and if it is placed in high friction situations, this product should have a smooth surface as much as possible.
6. The product should be customized for different situations and functions.
7. The product must be machinable. In many cases, the repaired position with this material must be made into the desired shape during the machining process.
8. In some cases, the magnetic behavior of the part is also important, and in such situations, this product should be developed with the desired magnetic property.

The product is a two-component product developed mainly based on Novalac epoxy resin. In order to improve its abrasion and corrosion resistance, ceramic particles have been used inside it. In addition, silicon carbide has been used in its formulation.

Advantages:

Proper quality





Heat Transfer Nanofluid

Azma Sanjesh Pishro Co.

www.asp-ltd.com

آزما سنجش پیشرو

Product Introduction:

Common heat transfer media usually consist of fluids such as water, ethylene glycol and various oils. These fluids have a low thermal conductivity compared to nanoparticles. For example, the thermal conductivity coefficient of copper at ambient temperature is 700 times the thermal conductivity coefficient of water and 3000 times the thermal conductivity coefficient of engine oil. Therefore, it is possible to improve their performance by adding nanoparticles to conventional thermal fluids without changing the design of mechanical systems.

Founded:

2010

Application:

The nanofluid product can be used in a variety of heat exchange systems such as heaters and heat exchangers with water-based fluids, ethylene glycol and oils.

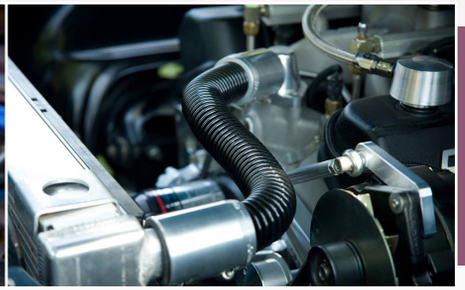
This product is a final B2B consumer product.

Technical Specifications:

The obtained product is actually a combination of synthesized nanocarbon with a conventional thermal fluid such as water and ethylene glycol. The addition of nanocarbon will increase the thermal transfer characteristics of the desired fluid, but it will not affect the thermal range of the fluid. The concentration of nanocarbon used is very low and below 5%. Things such as single-walled or multi-walled nanocarbon, size of nanocarbon, morphology, type of functionalization, etc. are conditions that should be optimized for a suitable nanofluid.

Advantages:

Reasonable price



Antifreeze Additive (NBS-22)

Afzoon Ravan Co.

www.afzoonravan.com

Product Introduction:

Car antifreeze additives are water-soluble organic and inorganic compounds that have a very high viscosity. These solutions are mixed with ethylene glycol as an antifreeze additive with a low percentage (5-6 by weight percent) and are produced and marketed as ready to use antifreezers in antifreeze manufacturing companies.

Founded:
2016

Application:

The role of this additive in the cooling system and anti-freeze solution is to prevent the formation of destructive phenomena such as corrosion, rust and foaming, which are created during the circulation of the anti-freeze liquid in the engine cooling circuit.

This product is a final B2B consumer product.

Technical Specifications:

In the structure of the engine (engine body, cylinder head, water pump, etc.), various metals and metal alloys are used, such as iron, steel, copper, brass, and most importantly, aluminum. Therefore, it is necessary to fully protect these metals against all kinds of corrosion mechanisms, such as electrochemical corrosion and cavitation phenomena, galvanic corrosion, etc.
In general, in the production of these additives, they are formulated based on the prevention of corrosion of all types of metals such as steel, cast iron, steel, aluminum, copper solder and brass in the engine system. These additives should be such that, in addition to being miscible in water and not reacting, they do not have a negative effect on other properties.

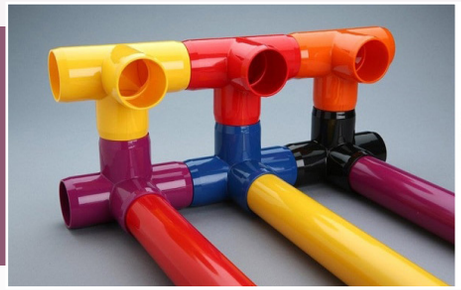
The ingredients in the formulation are as follows:

1. Yellow metal compounds (such as copper, brass, etc.) - use of organic compounds such as azoles, benzoates, etc. to prevent the corrosion of these metals
2. Metals such as steel, steel, iron and cast iron - the use of mineral compounds such as phosphates, sodium nitrites and...
3. Aluminum and solder - use of sodium silicate compounds
4. Additives to adjust pH and Adjusting the concentration of the solution in water

All these compounds are combined with specific percentages with a suitable pH range and temperature, and finally a viscous solution or a specific pH range is presented as the main product, which becomes antifreeze by combining with 95% ethylene glycol.

Advantages:

High production volune



PVC Paste Stabilizer

Fan Avaran Baspar Momtaz Co.

Product Introduction:

Polyvinyl chloride or PVC is one of the most widely used polymers due to its suitable physical and mechanical properties. However, this polymer may be degraded during the process. Therefore, stabilizers should be used as additives in it. These materials prevent the rapid destruction of PVC.

Founded:
2019

Application:

Therefore, the additives used should be non-toxic in addition to stabilizing PVC.

This product is a final B2B consumer product.

Technical Specifications:

The company's products are based on calcium and zinc and do not contain lead or tin. These products are offered in two grades that have the same structure and differ only in the ratio of calcium and zinc and the type of antioxidant. This difference is related to the use of stabilizer in the production of the final product. The grade with higher transparency and lower thermal stability is used in transparent films and the production of medical equipment. Another grade is used to produce products such as hoses, which are generally thicker and less sensitive to transparency.

Advantages:

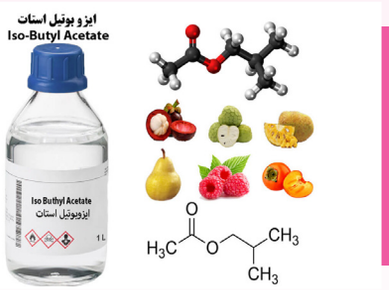
Good quality

Fourth Chapter

Solvents & Acids

4th CHAPTER

Solvents and Acids



Ester Solvents

Exirpooyan Chemical Industries Co.

www.exirpouyan.com

Product Introduction:

All these solvents are ester solvents which are synthesized during the reaction of the corresponding alcohol with acetic acid. The synthesis process of these products is a well-known single-step condensation that is obtained in the presence of acid catalysts. This is an equilibrium reaction and is associated with the release of water, which must be removed from the environment during the process. But there is always some water left in the system. The reaction is carried out under ambient pressure and temperature. The reaction is equilibrium and after reaching a percentage of progress, it is either stopped or greatly slowed down. The most important issue in the purification of these solvents is that these solvents are mostly azeotropic with water, making it difficult to purify them to high purity.

Main Export Destinations:

Turkey, Georgia, Iraq, Afghanistan, Pakistan

Export History:

Between 10,000,000 - 50,000,000 $

Founded:

2004

Application:

All kinds of industries, including paint and resin, cosmetics, printing and packaging, all kinds of coatings, pharmaceutical industries, artificial leather, etc.

This product is a final B2B consumer product.

Technical Specifications:

	Purity (%)	Boiling point (°C)	Application
Methyl acetate	99.5 and 85	57	All kinds of air dry paints, glues and nail polish removers
Ethyl acetate	99	77	The main application of ethyl acetate is in printing and packaging industries. In these industries, it is used as printing ink in flexo, helio and rotogravure printing machines and also as raw materials in the production of printing inks for other printing machines.
Normal butyl acetate	92 and 99.5	126	Paint and resin industries, all kinds of thinners, all kinds of polishes, coatings, glue, synthetic leather, cleaners and in the pharmaceutical industry.
Iso butyl acetate	95 and 99.5	118	Paint and resin industries, all kinds of thinners, all kinds of polishes, coatings, glue, synthetic leather, cleaners and in the pharmaceutical industry.
Butyl glycol acetate	95 and 99	192	Its most important application is in the paint coating industry, which acts as a very strong and stable solvent (slow evaporation). Also, butyl glycol acetate can be used as a good solvent for urethane paints, printing machine ink (including letterpress), pen and liquid ink, furniture wax and spray, wood paint and glue, etc.

Advantages:

- Reasonable price
- High purity
- High production volume

Chemical Solvents with High Purity and USP Grades

DR. Mojallali Industerial Clemical Complex Co.

www.drm-chem.com

Product Introduction:

As their name suggests, organic solvents are an essential group of substances that play the role of a diluent and a substrate for carrying out the reaction as a solvent. Meanwhile, during the production of high-purity solvents, we face more complexity, which increases their price and makes their applications more specific.

Founded:
2000

This product is a final B2B consumer product.

Technical Specifications:

Solvent	Purity (%)	Grade
Acetone	99.9	HPLC
Methanol	99.5 & 99.9	GC & HPLC
Isopropanol	99.8 & 99	GC & HPLC

Advantages:

Lower price than similar products

Methyl Acetate with a Purity of More than 99%

Kimya Resin Arak Co.

www.kimyaresin-arak.com

Product Introduction:

Methyl acetate is an ester solvent synthesized during the reaction of methanol with acetic acid. This product is produced with a purity below 98.9% in a single-stage condensation known for the presence of acid catalysts, specifically paratoluenesulfonic (p-toluenesulfonic) acid (PTSA). Its production occurs under an equilibrium reaction associated with water removal. But in any case, some water remains in the system. The reaction is carried out under environmental pressure and temperature. The reaction is equilibrium; after reaching a percentage of progress, it is either stopped or slowed down.

Main Export Destinations:
Turkey, Turkmenistan, Iraq

Export History:
Up to 500,000 $

Founded:
2001

Application:

Methyl acetate solvent with high purity (over 99%) and small water content is widely used in the industry, especially the printing industry, and can be used as a substitute for acetone. This solvent has a vapor pressure and boiling point close to that of acetone. Its solubility constant is also somewhat close to acetone (its polar solubility constant is slightly lower) and can act as a substitute for acetone in many cases.

This product is a final B2B consumer product.

Technical Specifications:

Reactive distillation process is a combination of distillation process and chemical reaction, both of which happen simultaneously inside a tower. This combination is very effective for processes where the reaction occurs at the appropriate temperature and pressure for separation. The simultaneous separation of the production products from the reaction causes the inappropriate side products to be removed from the process. As a result, the efficiency of the operation increases. For this reason, the problem of separating substances that have a boiling point close to each other or form an azeotrope together is largely eliminated. The desired reaction can be homogeneous and non-homogeneous catalytic reactions, creating several advantages compared with conventional processes. The company uses this method in product production. In the production of methyl acetate, because the product with methanol makes an azeotropic compound and this compound is 81.3 percent by weight of methyl acetate, and the rest is methanol, all the existing producers in the country are not able to produce higher purity methyl acetate due to the special conditions of this process. The importance of producing methyl acetate with %99 purity is due to breaking this azeotrope in a tower that does both the work of the reactor and the distillation tower.

Advantages:

- High purity
- Appropriate production volume

1,3-Dioxolane Solvent

Sanat Sabz Tabarestan Co.

www.sanat-sabz.com

Product Introduction:

Dioxalan (with the chemical formula $(CH_2)_2O_2CH_2$) is known as a special specialized solvent, with high solubility power, green and completely compatible with the environment. This solvent is a cyclic acetal, which is a clear colorless liquid and is slightly denser than water. Its unique feature is its high solubility. This solvent is very similar to THF and MEK solvents.

Main Export Destinations:
Turkey, Turkmenistan, Iraq, Afghanistan

Export History:
Up to 500,000 $

Founded:
2002

Application:

- 1,3-Dioxalane is used as chain length regulator and chain transfer agent in POM polymerization process.
- It is used as a swelling agent or as a finishing agent in the textile industry.
- Used as a paint solvent, polish, paint remover and cleaning product. It is also used as a stabilizer for halogenated solvents.
- It is also used in lithium batteries and as a solvent for oils, fats, waxes and paints.
- This material is a suitable substitute for a wide range of solvents used in adhesives such as PVC adhesives, PU adhesives, heat sealable adhesives and contact adhesives.

This product is a final B2B consumer product.

Technical Specifications:

The specifications of this solvent are as follows:

- **Boiling point:** 74°C
- **Melting point:** -26°C
- **Density:** 1.066 g/ml
- **Flash point:** 2 degrees Celsius.
- **Purity:** over 99% and water content less than 0.5%

This substance is produced from the reaction between aldehyde (formalin) and alcohol (ethylene glycol) in the presence of an acid catalyst. It forms azeotrope with water at 70-73 degrees Celsius. Its water content in azeotrope is about 7.6% and the purity of the material produced by the company is above 99%.

Advantages:

- High production volume
- Reasonable price

Methanol with a High Purity of 99.5% (USP Grade) and with a High Purity of 99.8% (GC and HPLC Grade)

Arman Sina Co.

www.armansina.com

Product Introduction:

The process of purifying chemical compounds, including methanol, is a process in which the degree of purity of the product must reach a value that can be used for its special application. Degrees of purity, in order of increasing degree of purity, are high purity, pharmaceutical grade or USP (abbreviation of United State Pharmacopoeia) and HPLC grade. Of course, there are laboratory grades, dry grades, GC grades, etc., which have a lot of overlap with the above-mentioned three grades of purity.

Increasing the degree of purity of some substances up to the USP level and some up to the HPLC level can have technical complications both in the design of the reaction (raw materials and catalyst) and in the design of the process to perform the purification process. Of course, cost considerations will also be an important part in choosing the method and process used for material purification. The level of high purity, USP and HPLC is a certain amount for each substance. For methanol, high purity grades mean purity grade ≥ 99%, USP grade - purity ≥ 99.5% and HPLC grade purity ≥ 99.8.

Founded:
1994

Application:

- USP grade methanol has medical uses in medical diagnostic laboratories.
- GC and HPLC grade methanol, as their name suggest, are used as mobile phases in GC and HPLC devices to identify and separate different compounds.

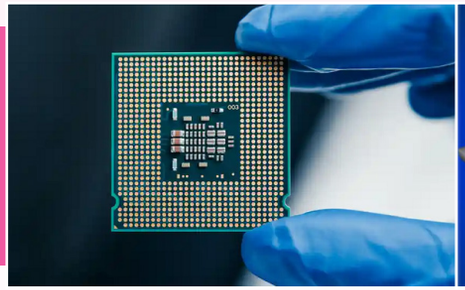
This product is a final B2B consumer product.

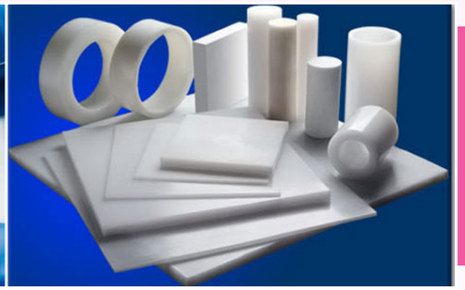
Technical Specifications:

If the impurities are volatile, fractional distillation or reverse distillation will be required. Due to the relative proximity of the boiling points of water and methanol (the difference is about 35°C) and other impurities, and also to achieve a high degree of purity, the component-by-component distillation method is used. The most important and complex part of this method is the design of the column or distillation tower. The column creates the vertical path through which the vapor must pass in the transfer from the distillation vessel to the refrigerant. During the transfer of steam from the distillation vessel to the top of the column, some of the steam is condensed. If the lower part of this column is kept at a higher temperature than the upper part, the liquid will condense and partially evaporate again while it falls to the bottom of the column. The non-condensed steam along with the steam obtained from the re-evaporation of the condensed liquid rises inside the column and passes through a series of condensation and evaporation. These actions cause the re-distillation of the liquid, so that in each of the stages of the vapor phase that is created, enriches the more volatile component. The condensed material that flows down the column enriches the material with less volatility compared to the steam that is in contact with it in each stage. The longer the column, the higher the purity of the volatile component.

Advantages:

High quality





Hydrogen Fluoride (HF) with More than 99% Purity

Fadak Sanat Pooya Shar Co.

Product Introduction:

Hydrogen fluoride with the HF formula is a gaseous chemical compound that is lighter than air. This compound boils at a temperature slightly lower than normal room temperature (like many hydrogen halides) at 19.5°C and solidifies below -84°C. This compound is one of the main sources of fluorine. By dissolving in water, it produces hydrofluoric acid, which has very high corrosive effects and is widely used in petrochemical industries. This substance is very toxic and can damage the lungs.

Hydrogen fluoride is produced by heating inorganic fluorine (CaF_2) with concentrated sulfuric acid. When these two combine and react at a temperature of 250°C, they produce hydrogen fluoride and calcium sulfate.

Founded:
2016

Application:

- HF gas is mainly used in the production of aluminum, chlorofluorocarbons and polytetrafluoroethylene.
- HF gas is used to separate uranium isotopes.
- HF gas acts as a catalyst in the oil and petrochemical industry.
- HF gas is used in the steel industry to patch stainless steels because it has the ability to react with metal oxides.
- Hydrogen fluoride gas is also used as a glass solvent in laboratories.
- Hydrogen fluoride gas is used in the production of semiconductors to remove oxides from the surface of silicon wafers.

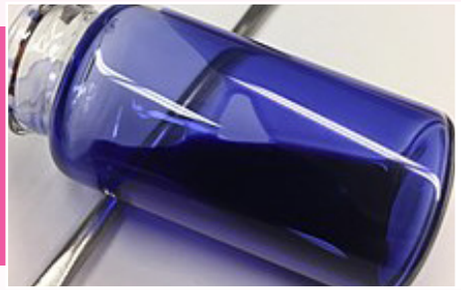
This product is a final B2B consumer product.

Technical Specifications:

Reactivity, absorption of moisture, corrosivity and ability to dissolve glass in hydrogen fluoride acid along with high toxicity are the things that make the production process of hydrogen fluoride with high purity difficult.

Advantages:

- High purity
- Proper production volume



2-Ethyl Hexanoic Acid

Petro Octane Isatis Co.

www.chemitis.com

Product Introduction:

2-Ethylhexanoic acid is an organic acid with the chemical formula $CH_3(CH_2)_3CH(C_2H_5)CO_2H$. This acid is a viscous and colorless liquid that is industrially prepared from the hydroformylation of propylene.

Main Export Destinations:
Turkey, UAE, Pakistan

Export History:
Up to 500,000 $

Founded:
2011

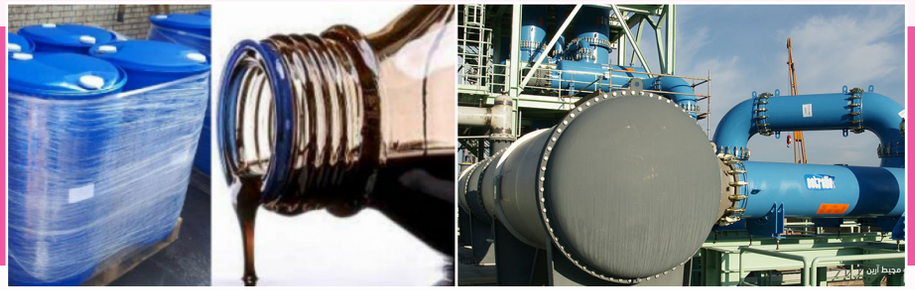
Application:

This acid is used in the production of metal catalysts, related organic salts and various esters.

This product is a final B2B consumer product.

Technical Specifications:

- **The production of this product is important in two parts:**
  1. Chemistry of the process: the production of this product is based on aerobic oxidation based on a metal-based catalyst on a ceramic substrate.
  2. Process design section: to achieve the highest conversion rate and achieve the highest purity.
- In fact, the company›s product is based on the aerobic oxidation of the corresponding alcohol, i.e. 2-ethylhexanol.
- **Purity:** min 99.5%
- **The amount of water available:** max 0.2%
- **Acid value:** 375-385 mgKOH/g



Sulfonic Acid Produced by the Method of Producing Liquid SO_3 from Solid Sulfur (LABS)

Kimiya Pajoohan Khavar Shimi Co.

www.kpks-acid.com

Product Introduction:

Alkyl benzene sulfonic acid linear or LABSA is known as sulfonic acid in Iran. This substance is a mixture of linear alkyl benzene sulfonic acid strings with 10 to 14 carbons in which the phenyl ring can be connected to 2 to 5 carbons. The physical and chemical properties of sulfonic acid depend on the length of the carbon chain and the mixture of its isomers. The primary material of sulfonic acid is called LAB, which is produced during the alkylation process of benzene with paraffins in the presence of a hydrogen fluoride or aluminum chloride catalyst. LABS is a synthetic surfactant that has the largest production volume among surfactants. Almost all sulfonation plants with sulfonation film reactors are designed based on sulfonic acid production. In this process, by burning sulfur and producing SO_2 and then converting it to SO_3 in the presence of a catalytic substrate, and then reacting SO_3 gas with linear alkylbenzene (LAB) in the reactor; Sulfonation is produced.

Main Export Destinations:
Iraq, Afghanistan, Pakistan

Export History:
Between 500,000 - 1,000,000 $

Founded:
2010

Application:

One of the advantages of LABS is its efficiency in acidic environments. Unlike alcoholic surfactants, such as Texapen, this product does not decompose in acidic environments. LABS is usually neutralized with various alkalis (mainly soda) and converted into sulfonate, which is used in many industries.

This product is a final B2B consumer product.

Technical Specifications:

This product is offered as the first product of these plants due to its relatively low price, very good efficiency and its biodegradable nature. LABS anionic surfactant with high detergency and emulsifying power is compatible with a wide range of anionic, nonionic and amphoteric surfactants.

Advantages:

- High production volume

Boric Acid with 99.6% Purity

IrChemineral Co.

www.irchemineral.com

Product Introduction:

Boric acid has the molecular formula H_3BO_3, which is sometimes written as $B(OH)_3$. This substance is a weak mineral acid soluble in water and is usually found in two forms of crystals or completely colorless crystals or in the form of white powder. Boric acid is produced in two industrial and analytical grades with different purity percentages for various applications. Its analytical grade has more than 99.5% purity.

Application:

- The best absorber for free neutrons in nuclear reactors
- To produce disinfectant solutions, sterile eye drops and ear drops in medicine
- Used in glazing and plating industry
- Used in the production of Insulation For Glass (IFG) and Reinforced Glass (RFG)
- In the production of insecticides to control cockroaches, termites, fleas, fire ants
- Melting agent in the welding industry
- In the jewelry and leather industry
- Liquid crystal glass in the flat screen
- Important application in the production of antifreeze

This product is a final B2B consumer product.

Technical Specifications:

In the general method, sulfuric acid is used to produce boric acid. When using sulfuric acid, due to the fact that the minerals used contain magnesium and calcium, magnesium sulfate and calcium sulfate will be precipitated or dissolved as impurities with boric acid, and they will be with boric acid during the crystallization stage. But this company has used hydrogen peroxide to produce boric acid with higher purity. The purity of the final product is 99.5%.

Advantages:

- High purity
- High quality
- Reasonable price

Hydrofluoric Acid (HF) with 60% Purity

Shadram Shimi Co.

www.shadramco.com

Product Introduction:

Hydrofluoric acid (HF) is a weak acid from the group of hydrohalic acids, and therefore it is molecularly soluble in water.
This acid has a colorless appearance with a very sharp and harsh aroma, which has the ability to dissolve many substances and is considered a unique compound in dissolving oxides (oxygenated compounds). Hydrofluoric acid can dissolve glass, that's why plastic containers are used to store it. It should be noted that the use of acid with a concentration of 60% is more common due to its efficiency and stability (less acid vapors).

Application:

The first category: hydrogen fluoride with a purity of more than 99% and named AHF, which is in a gaseous state and due to its high purity, has the following special applications:

- HF gas is used to separate uranium isotopes.
- HF gas acts as a catalyst in the oil and petrochemical industry.
- HF gas is mainly used in the production of aluminum, chlorofluorocarbons and polytetrafluoroethylene.
- HF gas is used in the production of semiconductors to remove oxides from the surface of silicon wafers.

The second category: HF (hydrofluoric acid) solution with a purity of 60%, which is in the form of a liquid solution, and due to its low purity, it has the following different uses:

- It is used in the steel industry to polish stainless steels: because it has the ability to react with metal oxides.
- It is also used as a glass solvent in laboratories.
- It is used in the production of hexafluorine and silicic acid (H_2SiF_6).
- In the production of potassium hydrogen fluoride as a mattifying agent and as a starting material in the production of elemental fluorine.
- It is used in the production of hexafluoride and silicates, such as hexafluoride and silicate of magnesium, zinc and copper, which are easily dissolved in water. In addition, they are mainly used as preservatives in wood protection.
- Sodium hexafluorosilicate is used in water fluoridation.
- Boron trifluoride is obtained from the reaction of hydrogen fluoride and boric acid in the presence of sulfuric acid, which is sold in pressurized gas cylinders. This substance is used as a complex or additive compounds (for example, with ethers, alcohols, carboxylic acids, etc.) or in pure form as a Friedel-Crafts catalyst.
- Tetrafluoroboric acid, which is produced as a 50% aqueous solution of boric acid and hydrofluoric acid, and other fluorine and alkaline borates, ammonium, and transition metals are used in the galvanic layer of metals, as a melting agent, straw ignition, etc.
- It is used in electrochemical fluorination of organic compounds. In this method, fluorine compounds are obtained by electrolysis of the corresponding non-fluorine compounds in liquid hydrogen fluoride. They are used in herbicides, straw combustibles such as $C_4F_9SO_3K$, repellents and grease for textiles, fire extinguishers, emulsifiers for tetrafluoroethylene polymerization, flow control agents and dripping colors, hardening agents, catalysts and membranes.
- In the production of polyvinyl fluoride (PVF), the combination of acetylene and hydrofluoric acid and the polymerization of the obtained vinyl fluoride are used, which causes the parts to be covered against water.

This product is a final B2B consumer product.

Technical Specifications:

The production process is as follows:

- Production of HF gas from the reaction of 98% sulfuric acid with calcium fluoride soil at a temperature of 250 to 270 °C.
- Removing dust particles and cooling HF gas
- Absorption of HF gas by the water inside the filled tower
- Finally, the produced HF reaches the desired concentration. It is the concentration of acid that can be packaged and as a result, its transportation will be simpler and safer.

Advantages:

- High Quality
- High production volume
- Reasonable price

Fumaric Acid

Wafa Darou Parsian Co.

Product Introduction:

Fumaric acid is the transbutene isomer of dioic acid with the formula COOH-CH=CH-COOH and the molecular weight is 116.07. Among its other properties, we can mention its white powdery appearance, with a melting point of 287 °C and a sour and acidic taste.
Its solubility in water at 25 °C is 0.63 g% and in water at 100 degrees it is 9.8 g%. This acid is slightly soluble in organic solvents such as alcohol, acetylene, and ether, and insoluble in chloroform, benzene, and xylene. Its purity is above 98.5% and its moisture content is less than 0.5%.

Founded:
2013

Application:

Fumaric acid is a chemical substance that is used in the resin industry as a substitute for phthalic resins in order to reduce the final price of the product. Food grade fumaric acid is also used as a preservative in the food industry. In addition, the fumarate salt of this compound is produced by the reaction of this product with some metals such as iron II, under the name of ferrous fumarate, which has medicinal uses. The methyl ester of this compound, dimethyl fumarate, also has many medicinal uses.

This product is a final B2B consumer product.

Technical Specifications:

Fumaric acid is the structural isomer of maleic acid and it is formed from this compound (maleic acid) as a result of the isomerization process in the presence of an acid that plays the role of a catalyst. Because fumaric acid is thermodynamically more stable than maleic acid, so the reaction proceeds towards the formation of this product.

Advantages:

- **Purity:** above 99%
- High production volume

Fifth Chapter

Mineral & Organic Salts

5th CHAPTER

Mineral and Organic Salts

Sections

Mineral salts

Organic salts

Heavy Calcium Carbonate and Pharmaceutical Grade Magnesium Hydroxide

Ehya Kimia Shargh Co.

Product Introduction:

Calcium carbonate with the chemical formula $CaCO_3$ is found in sedimentary rocks of the earth's crust, such as calcite and aragonite, and constitutes about 4% of the earth's crust. Today, the production of calcium carbonate is done in various industrial and pharmaceutical grades. Its industrial grade is mainly used as a filler and its pharmaceutical grade is also used in the production of various drugs.
Magnesium oxide with the chemical formula MgO is a mineral compound that exists in nature as a periclase mineral. In aqueous environments, this compound quickly combines with water and forms magnesium hydroxide.

Founded:
2008

Application:

Calcium carbonate:

- Pharmaceutical, health, plastic, papermaking, construction and agriculture industries

Magnesium hydroxide:

- As an anti-acid, mild laxative and non-medicinal uses

This product is a final B2B consumer product.

Technical Specifications:

The product offered in this company is of interest due to obtaining a pharmaceutical grade from the relevant authorities. It should be noted that receiving pharmaceutical grade requires consideration of high degree of purity, absence of heavy metal pollution, appropriate granulation and density. The final product is presented with a purity of over 99%.

Advantages:

Reasonable price

International Standards or Permissions:
USP 43 and BP 2019 pharmacopoeias

Potassium Nitrate with Purity Higher than 99.9% - Using Potassium Chloride and Nitric Acid

Gohar Shimi Khebre Co.

www.goharshimi.com

Product Introduction:

Potassium nitrate (a chemical compound with the formula KNO_3) exists naturally in places such as the walls of caves in a white round form. There are various methods to produce potassium nitrate, the simplest method is the use of nitric acid. By pouring nitric acid on potassium salts, potassium nitrate is obtained. Potassium nitrate is similar to salt that absorbs water and moisture. Potassium nitrate is soluble in hot water and it is also slightly soluble in cold water. When this compound is heated or decomposed, it releases oxygen. Potassium nitrate is a strong oxidizing agent that reacts with other organic compounds and burns and explodes as a result.

Main Export Destinations:
Uzbekistan

Export History:
Up to 500,000 $

Founded:
2006

Application:

- Solid rocket fuel production
- Gunpowder production
- Ceramic glaze production
- Medical use as a diuretic
- Meat processing (food industry)
- Chemical fertilizer production & etc.

This product is a final B2B consumer product.

Technical Specifications:

- Purity control of production materials using coprecipitation conditions.
- Removal of pollutants in nano-coated plates.
- The melting point is 334°C and the boiling point is 400°C.

Advantages:

High production volume

Precipitated Calcium Carbonate (BARIN)

Chimie Maadani Hamedan Co.

www.cmhco.ir

Product Introduction:

Precipitated Calcium Carbonate (PCC) is a pure and high-quality type of calcium carbonate that is produced chemically. Among the features of this product, we can mention the uniform structure and shape, the same particle size, suitable coating and its high purity. This product has special physical and chemical characteristics that have a significant impact on its application in various industries.

Main Export Destinations:
Russia and Iraq

Export History:
Up to 500,000 $

Founded:
1997

Application:

Precipitated calcium carbonate is one of the most widely used raw materials in various industries. These industries include: paper making, polymer industries, rubber industries, paint and industrial coating industries, pharmaceutical, cosmetics and hygiene industries, etc.

This product is a final B2B consumer product.

Technical Specifications:

There are different methods in the process of producing sedimentary carbonates. In most methods, calcium carbonate is a side product of the reaction, and the main product is another chemical substance such as ammonium chloride, caustic soda (chlorine salts, phosphorus salts, etc.), which often increases the cost of calcium carbonate production. The most economical method is the direct production method of limestone mineral. In this method, limestone is converted into calcium oxide and carbon dioxide by calcination at a temperature of 900 to 1100 degrees Celsius. Then the obtained calcium oxide is hydrated after mixing or reacting with water and calcium hydroxide (limewater) is obtained. On the other hand, the carbon dioxide resulting from the calcination process is also refined and purified in various processes. Finally, calcium hydroxide and carbon dioxide react under certain conditions and produce $CaCO_3$ suspension. Then the resulting suspension is placed in the purification and dewatering process. After drying, the particles are again crushed in the mill and then separated. Product covering and coating operations are also done at this stage.

Advantages:

Reasonable price

Silica Nanostructure Powder

Isatis Nano Silica Co.

www.isatissilica.com

Product Introduction:

Production of nano-structured silica powder (SiO_2) is done by precipitation method using sodium silicate and sulfuric acid. In this method, a clear gel solution is produced by adding diluted sulfuric acid to the sodium silicate solution diluted up to 4 times with water. In this process, controlling the final pH of the product has a great impact on particle size, particle size dispersion, and particle accumulation rate; So, the best pH for this purpose is pHs above 9 and below 10.5: at lower pHs, silica particles move from the negatively charged state to neutral particles, and at pHs above 10.5, silica particles leave the nanoparticle state. On the other hand, the use of anionic and non-ionic surfactants during the synthesis process can affect the agglomeration of particles and prevent this phenomenon from occurring. The amount of addition of the mixture of surfactants and functional groups on them completely affects their performance in the synthesis process.

Founded:
2013

Application:

The uses of this product include:

- In the concrete industry for the production of self-dense concrete
- In rubber making as a reinforcing agent
- and using as an abrasive in toothpaste.

This product is a final B2B consumer product.

Technical Specifications:

In industries that use synthetic amorphous silica, mainly nano-structured silica powders are more popular than nano-silica powders. In fact, nano-silica powders like fused silica are often very light, which is why they are difficult to use in many cases. Therefore, consumers of synthetic amorphous silica powders often prefer micron grains that are formed from nanoparticles and use special granulations in the industry.
For example, in the toothpaste industry, nanostructured silica powders must be less than 10 microns in size to be used as an abrasive agent.

Advantages:

High quality at a competitive price

Potassium Sulfate with a High Purity of 99.8% and the Permissible Amount of Chlorine

Shemshad Shimi Co.

www.shemshadshimi.com

Product Introduction:

Potassium sulfate is an inorganic chemical substance with the chemical formula K_2SO_4. This substance is obtained from the reaction of potassium chloride and sulfuric acid under controlled temperature conditions. This compound is white to cream colored and is soluble in water.

Founded:
2016

Application:

The most common use of potassium sulfate in agriculture is as potassium sulfate fertilizer, supplying potassium and sulfur. The possible presence of chlorine in this composition is harmful for plants. Potassium sulfate is also used in glass making. In the military industry, potassium sulfate is used to reduce the intensity of the light flash resulting from the explosion of heavy artillery shells, such as cannon and tank shells and mortars.

This product is a final B2B consumer product.

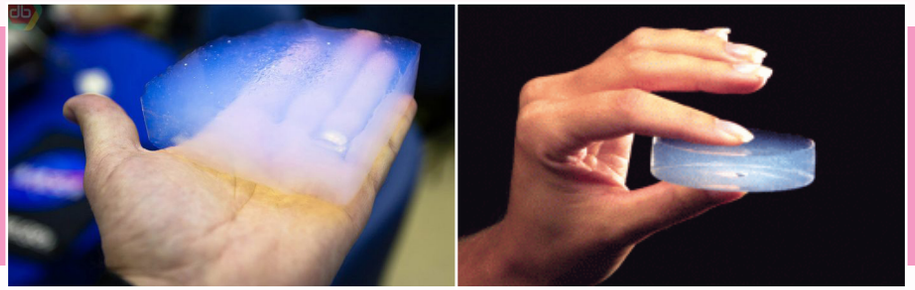
Technical Specifications:

The intended product is prepared for use as fertilizer in the agricultural industry. For this reason, its residual chlorine is very low and its other physical properties are as follows:

- **Solubility:** soluble in water and glycerol (the degree of solubility in water depends on temperature so that it increases with increasing temperature)
- **Insolubility:** acetone and alcohol
- **Minimum potassium based on K_2O in weight percent:** 51
- **Minimum sulfur based on S by weight percent:** 17.5
- **The minimum amount of particles with a size between 0.2 and 1 mm:** 90%
- **Maximum moisture by weight percent:** 1.5
- **Molar mass:** 174.25 g/mol
- Odorless
- **Density:** 2.66 g/cm
- **Melting temperature:** 1.069 ^{0}C

Advantages:

Proper production volume



Tetraethyl Orthosilicate and Tetramethylorthosilicate

Couple Shimi Sepahan Co.

www.coupleshimi.com

Couple Shimi Sepahan

Product Introduction:

These chemicals belong to the category of orthosilicates. These materials produce SiO_2 when hydrolyzed and depending on the conditions of hydrolysis or the reactions in which they participate, they find very diverse properties and applications. For this reason, they are used in various industries.

Founded:
2013

Application:

Tetraethylorthosilicate (TEOS) and tetramethylorthosilicate (TMOS) are impenetrable and repairing additives for building materials (concrete, brick, stone, etc.). They are also used in the production of aerogel, sol-gel and silica (SiO_2) with high purity (such as silica foam or urosil). They can also be used as coupling agents in composites and polymers.

This product is a final B2B consumer product.

Technical Specifications:

- **Appearance:** Colorless to pale yellow transparent liquid
- **Purity:** ≤ 98
- **Density** 0.93 g/cm³
- **Boiling point** 168 °C
- **Percentage SiO_2:** ≈ 28 wt.
- **Ignition point:** 55 °C

Advantages:

High quality at a competitive price

Lithium Silicate and Lithium Potassium Silicate

Couple Shimi Sepahan Co.

www.coupleshimi.com

Couple Shimi Sepahan

Product Introduction:

This primer penetrates into the surface texture of building materials, where it reacts with calcium and magnesium salts and forms polyhedral matrix networks of double lithium-calcium silicate and the like. In addition, it blocks pores and capillary tubes and does not allow water particles or steam, oil and even harmful gases to penetrate. On the other hand, absorbing calcium and calcareous compounds by this primer practically makes the material anti-dandruff.

Founded:
2013

Application:

These primers have high penetrating power on the surfaces of non-metallic materials such as concrete, stone, brick and plaster. They are used as concrete quickeners, waterproofing, anti-dandruff, building gloss and densifier, as well as fireproof coating. Each of the compounds has a different depth of penetration and gloss according to the type of material and the needs of the applicant.

This product is a final B2B consumer product.

Technical Specifications:

These products can be obtained from two different reactions and at the right temperature and amount of raw materials: the reaction of tetraalkylorthosilicates (currently tetramethylorthosilicate) with lithium metal hydroxides or a mixture of lithium and potassium hydroxides.

- **Appearance and amount:** Clear liquid
- **Purity:** ≤ 99
- **pH=**13-11.5
- **Weight ratio:** Si_2O / (Li_2O + K_2O) 0.5 ± 2.3
- **Solid percentage:** wt. 0.5 ± 10%

Silicate primer is based on potassium lithium silicate, in the form of an aqueous solution, colorless and transparent and completely inorganic.

Advantages:

High quality at a competitive price

Magnesium Sulfate Heptahydrate with Technical Grade and Purity of 99.8%

IrChemineral Co.

www.irchemineral.com

Product Introduction:

Magnesium sulfate tetrahydrate with molecular formula $MgSO_4.7H_2O$ in health grade or bath salt, which is also known as Epsom salt, has many benefits for health and beauty. This salt often relieves pain in different parts of the body. Epsom salt is a combination of magnesium and sulfate. This salt has been used to solve health problems since 1500 years ago.

Application:

- In the agricultural industry (fertilizer providing magnesium and soil sulfur)
- In the pharmaceutical industry (reducing stress, pain and inflammation, relieving constipation, improving nerve and muscle function)
- cosmetics and health industries

This product is a final B2B consumer product.

Technical Specifications:

Magnesium sulfate tetrahydrate with technical grade and purity of 99.9% is a side product obtained from the preparation of boric acid. After separating the residue containing magnesium from boric acid, sulfuric acid is added to the remaining mineral in a separate step, and then in the crystallization step, its crystals are obtained. Industrial grade is used as chemical fertilizer and technical grade is used in pharmaceutical industries.

Advantages:

- High purity
- Reasonable price

Sodium Perborate with High Purity of 99.5%

IrChemineral Co.

www.irchemineral.com

Product Introduction:

Sodium perborate (with the formula $nH_2O.NaBO_3$) is a white powder, odorless and soluble in water, which is hydrolyzed to hydrogen peroxide and boron. Sodium perborate monohydrate and tetrahydrate are the most commercially used. Sodium perborate is an inexpensive, readily available substance that is commercially produced at high scales with a purity of 96-98%. This material has a long service life and is non-toxic. Users of sodium perborates believe that this substance is a relatively safe and mild oxidizing agent compared to other oxidizing agents. This oxidizer leads to the destruction of pathogenic microorganisms.

Application:

Sodium perborate is added to some cleaners to improve its cleaning capacity. These types of cleaners are effective in removing stains, bleaching and preserving the color of textiles. It is also used in a large number of cleaning products, including dishwashing and laundry detergents, bleaching powders, fabric softeners, toilet detergents, multipurpose cleaners, air fresheners, and stain removers.

This product is a final B2B consumer product.

Technical Specifications:

This company has used magnesium silicate for sedimentation of sodium perborate in order to produce sodium perborate with a purity of more than 99.5% on an industrial scale. By dissolving perborates in water, hydrogen peroxide is released. The next important step in production is the removal of calcium and iron. Based on the tests, the product has 93.9 ppm calcium and 1.1 ppm iron with ICP report, and the final purity of sodium perborate prepared by this method reaches over 99.5%.

Advantages:

- High purity
- Reasonable price

Basic Chromium Sulfate Produced from Chromite

Exir Sanat Sabz Andish Co.

Product Introduction:

Basic chromium sulfate is a compound or mineral salt with the chemical formula $Cr_2(SO_4)_3.x(H_2O)$, which is mainly used in the tanning stages of sheep and cow skins to produce leather. This composition is in a watery form (15 or 18 water) with a green color and very soluble in water.

Founded:
2016

Application:

The main use of this product is in the leather industry, which turns the leather into Wet Blue intermediate. This material makes the leather soft and smooth and also increases the leather gloss.

This product is a final B2B consumer product.

Technical Specifications:

This compound is produced by the reaction of sodium dichromate with sulfur dioxide gas:

$Na_2Cr_2O_7 + 3\ SO_2 + H_2O \rightarrow Cr_2(SO_4)_3 + 2\ NaOH$

Sulfur dioxide gas is oxidized to sulfate and turns VI or hexavalent chromium into III or trivalent chromium. The side product is sodium hydroxide: the sodium hydroxide produced can be neutralized sulfuric acid and produce sodium sulfate, which can be present up to 33% in the final product due to the lack of effect in the tanning stages of the skin. 6-valent chromium is a carcinogenic agent, and as a result, one of the important points in the production of this product is the conversion of all 6-valent chromium into 3-valent chromium. The primary material of the company's product production is chromite ore, which is transformed into sodium dichromate by going through several stages and finally transformed into chromium sulfate by the reaction that was mentioned at the beginning.

Advantages:

Good quality

International Standards or Permissions:
Confirmation of the acceptable percentage of chromium VI from POLO TECHNOLOGICO CONCIARIO (Italy)

Sodium Cyanide

Hooman Shimi Sepehr Co.

Product Introduction:

Sodium cyanide (with the chemical formula NaCN) is a chemical compound with a molecular mass of 49.0072 g/mol. The appearance of this compound is a white solid and this substance is very toxic. The main and cost-effective method of producing this compound in the world is the reaction of hydrogen cyanide with soda. Hydrogen cyanide is produced through the Andrussow and Degussa oxidation process through the reaction of ammonia and natural gas in the presence of oxygen.

Founded:
2016

Application:

Sodium cyanide is one of the widely used materials in gold mining and its main use is in this industry. This substance is used as a synthetic precursor to produce products such as EDTA and nitriles.

This product is a final B2B consumer product.

Technical Specifications:

The company's product is available with two levels of purity: 60% and 98%.

Ammonium Sulfate

Using Phosphogypsum

Parand Kimia Parmis Co.

Product Introduction:

Ammonium sulfate is used as a fertilizer providing nitrogen and sulfur needed by plants, especially in soils with high pH. The main method of producing ammonium sulfate is the reaction between ammonia and sulfuric acid.

This product is a final B2B consumer product.

Technical Specifications:

Phosphogypsum is the waste of phosphoric acid production, the majority of which is calcium sulfate. The company has used this material as a supplier of sulfate and has produced ammonium sulfate by reacting it with ammonia and CO_2.

Application:

Agriculture industry

Founded:
2018

Calcium Stearate, Zinc Stearate and Magnesium Stearate

Fan Avaran Shimi Zarin Iranian Co.

www.fanchem.ir

Product Introduction:

Metal soaps are salts of fatty acids that have wide industrial applications in cosmetics, pharmaceutical, plastic, polymer and petrochemical industries and are used as thermal and optical stabilizers as well as anti-foam and anti-humidity. Metal stearates are among the most important and useful metal soaps in industries. Magnesium stearate is one type of anionic salt of fatty acids, which is a white powder and has a special smell. Magnesium stearate has high adhesive properties and good lubrication.

Founded:
2019

Application:

Calcium stearate:
It is used as a silan agent in powders including some foods (such as smarties (candy beans) and surface softener of hard sweets), an agent preventing water penetration in fabric, a softening agent in the core of pencils and crayons. In the concrete industry, calcium stearate is used to control the secondary efflorescence of cement materials (in the production of concrete products such as paving stones and blocks). In addition, it is possible to create water resistance for these products. In the papermaking industry, calcium stearate is used as a lubricant that provides a good gloss and prevents dusting and cracking in the manufacture of paper and cardboard.

Zinc Stearate:
It is used as a stabilizer in polymer petrochemicals and as a dispersant in the paint and sealer industry.

Magnesium stearate:
This product is soluble in oily hydrocarbons and grease at high temperature, but insoluble in alcohol and water. It can be added to powder cosmetics. In the building, it is also used as a waterproofing agent in cements and plasters.

This product is a final B2B consumer product.

Technical Specifications:

- Calcium stearate has mesh: 250, melting point: 150 to 160°C and density: 0.3 kg/liter.
- The formation of zinc stearate is done from the raw materials of zinc hydroxide, or zinc oxide with stearic acid in the solid phase. The amount of water in the product is below 0.1% and the purity of the product is above 99%.
- Magnesium stearate has mesh: 140, melting point: 115 to 135°C and density: 0.2 kg/liter. This substance is produced as a result of the reaction between stearic acid and magnesium oxide, and the amount of water in the product is up to 4%.

Advantages:

High quality at a competitive price

Sodium Carboxymethyl Cellulose (CMC)

Mide Soushiant Bonyan Sanat Co.

Product Introduction:

Sodium carboxymethyl cellulose (CMC) is a type of cellulose ether carboxylate. This cellulose is prepared from the chemical modification of cellulose with chloroacetic acid in order to increase its solubility in water and aqueous solutions. The main feature of this product is to increase the concentration (thickening agent) of aqueous solutions, which is used to increase the viscosity of aqueous solutions.

Founded:
2017

Application:

The applications of this product include: use as an adhesive, stabilizer, emulsifier, viscosity controller, and also a flow controller of chemical solutions in all kinds of food, pharmaceutical, cosmetic, paper, tile and ceramic products, glue, resin, drilling mud and electrode manufacturing plant. This material can form a film and is resistant to oil, waxes, greases and other organic solvents.

This product is a final B2B consumer product.

Technical Specifications:

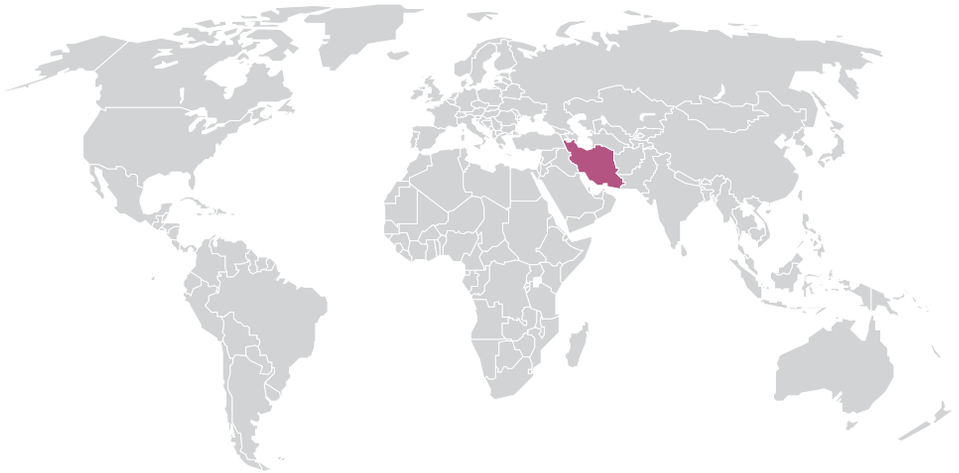
Due to the addition of polar carboxylate groups on this product due to the reaction of cellulose with chloroacetic acid, the solubility of cellulose in aqueous solutions has become possible. On the other hand, due to the polymer structure with many hydroxy and carboxylic acid groups or carboxylate salts, many hydrogen bonds have been established with water molecules and other polar molecules in aqueous solutions. As a result of these events, the viscosity and concentration of aqueous solutions increases. By increasing the purity of CMC to 99.5%, this product can be used in the pharmaceutical industry. The degree of purity for industrial use of this product is mainly below 90%.
The production steps of CMC are as follows:

1. Primary washing and purification (separation of cellulose from other impurities such as lignin) to prepare alpha cellulose (Bleaching)
2. Additional alkalization and complementary purification (removal of vegetable oils and hemicellulose) (Alkaslization)
3. Carboxymethylation (Etherification)
4. Neutralizing (Neutralizing & rinsing)
5. Filtration, washing and drying (drying)

iHiT

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

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NAIROBI iHiT

Manager: Ali Baniamerian

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

Country: Republic of Kenya – Nairobi

Services:

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

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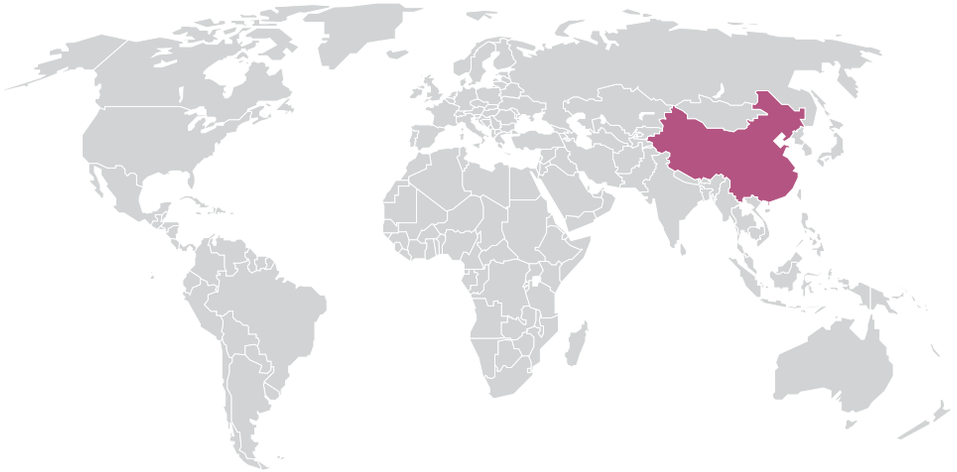

SUZHOU iHiT

Manager: Amir Ghorbanali

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

Country: People's Republic of China - Shanghai

Services:

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

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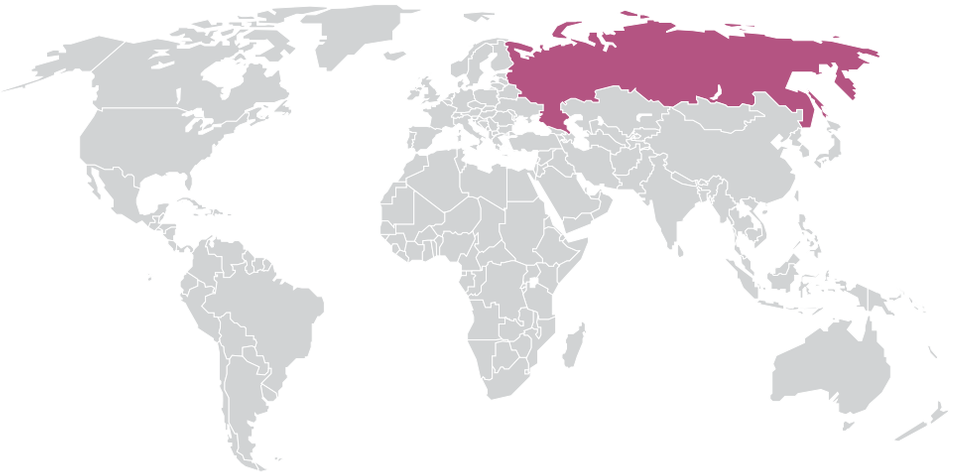

MOSCOW iHiT

Manager: Mahdi Deilam Salehi

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

Country: Russian Federation – Moscow

Services:

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

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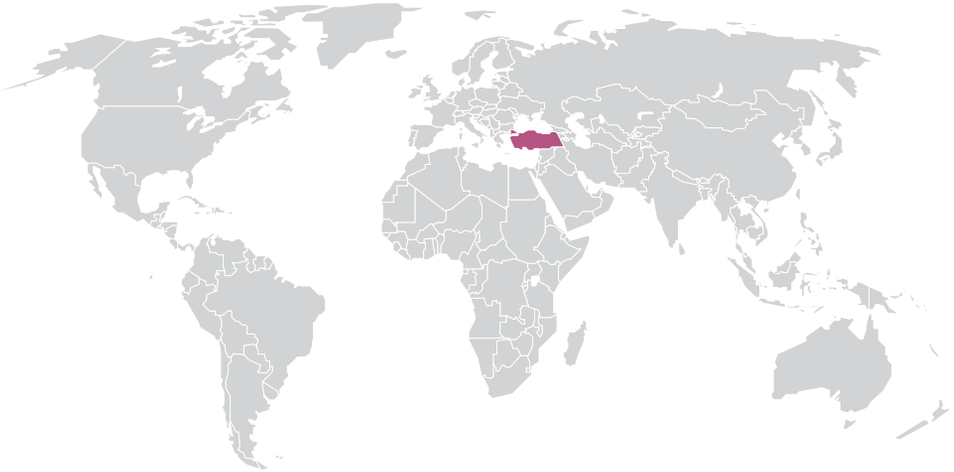

ISTANBUL iHiT

Manager: Masoud Hasani

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

Country: Turkey – Istanbul

Services:

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

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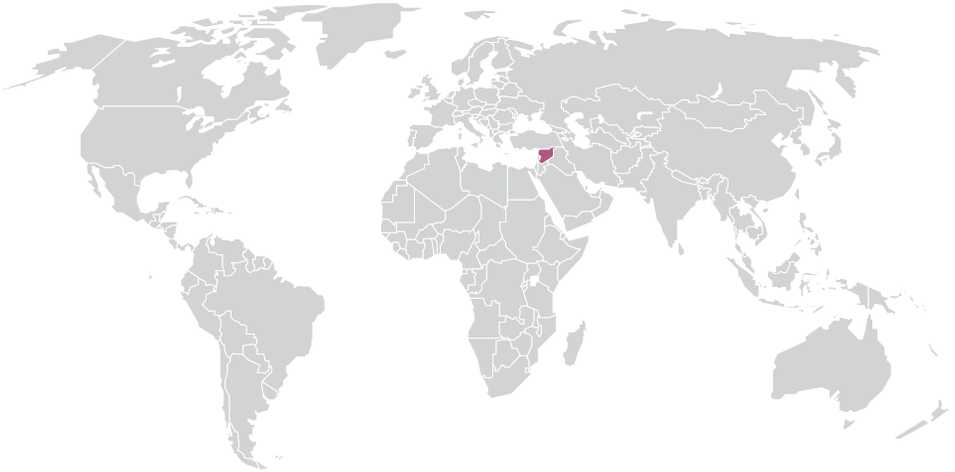

DAMASCUS iHiT

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

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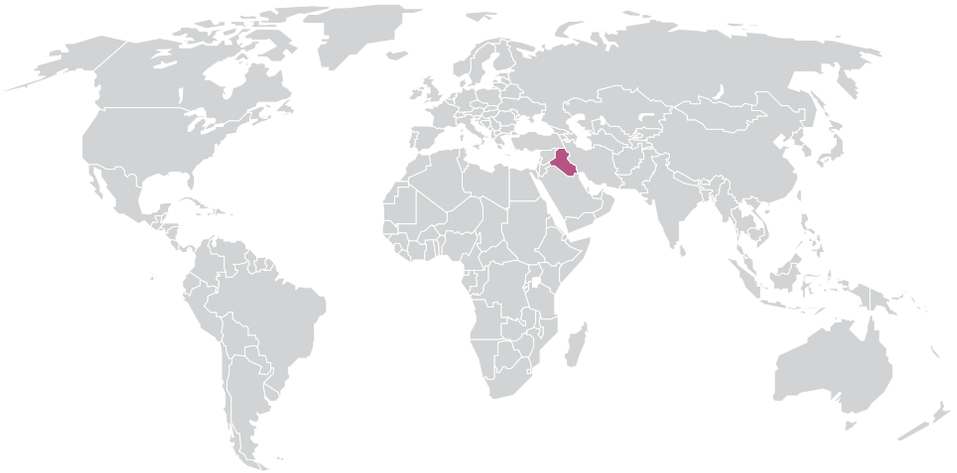

Iraq (Sulaymaniyah) iHiT

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
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