

Adsorbents and Catalysts

A Global Manufacturer



HENGYE

www.hengyeinc.com



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Why Choose Hengye Inc?

We offer you

- Molecular sieve, activated alumina, silica gel
- Ideal adsorption capacity and product durability
- ISO certified manufacturing, consistent quality

We will provide

- Reliable adsorbents and catalysts, proven success
- Engineering, technical service, and sales support
- Inventory in Houston, TX; Omaha, NE; Shanghai, CN
- Material analysis and capacity evaluation
- Change out, turnaround services

Products

Molecular Sieve

Beads, Pellets, Powder

Activated Alumina

Beads and Powder

Catalysts

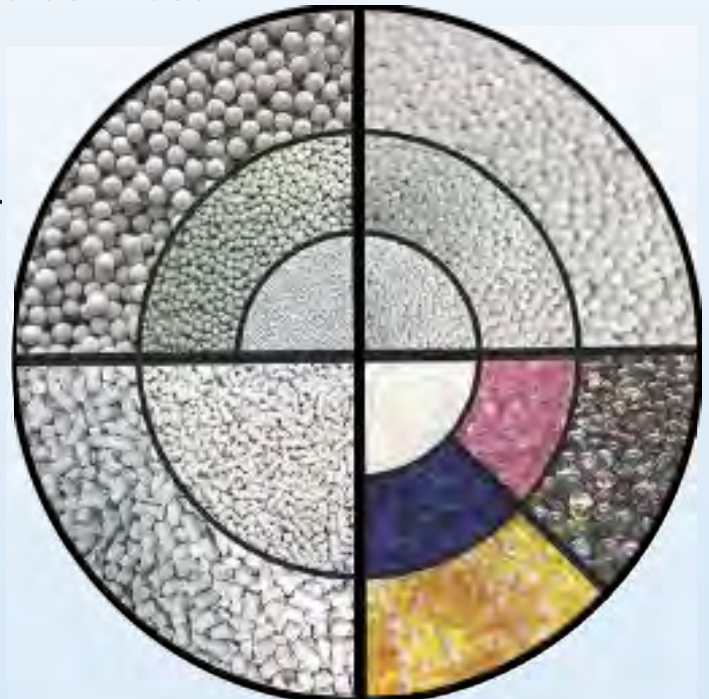
Specialized Products

Silica Gel

White and Indicating

We can support

- Monitor efficiency, optimize productivity
- Product advice and solutions, industry tips
- Quick order processing, responsive communication
- Hands on site and remote technical support
- Operations training and product care education



Standard Molecular Sieves

Molecular sieve can be manufactured in a variety of sizes and with unique chemical properties. Our team of engineers and technical advisors can help select the ideal product for your application.



4x8 mesh | 8x12 mesh | 20x40 mesh | 1/8 Inch | 1/16 Inch

Type 3A Molecular Sieve

- Ideal for dehydrating solvents and polar liquids
- Greatest affinity for adsorbing water molecules
- Most selective of all molecular sieves

Type 4A Molecular Sieve

- Ideal for dehydrating hydrocarbon streams
- Ideal for bulk dehydration applications
- High adsorptive capacity for water

Type 5A Molecular Sieve

- Ideal for dehydrating air streams
- Ideal for dehydrating hydrocarbon streams

Type 13X Molecular Sieve

- Ideal for generating high purity oxygen streams
- Ideal for refining and cryogenic separation processes
- Adsorbs sulfurous compounds, mercaptans, and more

Specialized Molecular Sieves

As the manufacturer, we've honed our technical product expertise and flexible production capabilities to create products that feature industry specific physical and chemical properties. These products are made to target process optimization opportunities for the end user.

Featured Products

- EthaDry for ethanol stream dehydration to fuel grade
- HYZSMS for fluid catalytic cracking units (FCCs)

Natural Gas

- WateRyd Series for dehydration
- SulfuRyd Series for Sulfur removal
- MercurRyd Series for Mercury removal
- NitroRyd Series for Nitrogen Rejection Units (NRUs)

Air Separation

- CryoDry Series for cryogenic air separation
- HydroFlo Series for high purity Hydrogen generation
- NitroFlo Series for high purity Nitrogen generation
- OxyFlo Series for high purity Oxygen generation

Petrochemicals

- BTXCleanse for aromatic dehydration
- EthylCleanse for Ethylene dehydration
- OleCleanse for mixed Olefin cracked gas dehydration

Refining

- ChloriClear Series for chloride adsorption
- IsoDry Series for isomerate stream purification

Activated Alumina

Our manufacturing facilities operate under ISO certified processes when producing our adsorbents. We offer a wide variety of size and functional options with our activated alumina products.

Size and Form



5-8mm | 1/4 Inch | 3/16 Inch | 1/8 Inch | 7x14 Mesh | 1/16 Inch | Powder

- Pseudoboehmite products also available

Physisorption, Physical Adsorption

As a physical adsorbent, activated alumina is a versatile product that can be used in both PSA and TSA applications and can handle either gas or liquid phase processes including:

- water purification
- bulk dehydration
- cryogenic air separation
- wastewater treatment
- desiccant air dryers
- air purification

Chemisorption, Chemical Adsorption

Activated alumina can be promoted with various compounds to enhance chemical adsorption abilities. Promoters are combined with activated alumina to target contaminants that standard activated alumina would not normally be able to remove.

Catalysts

Catalysts are specialized products that are used to lower the required temperature for a reaction to occur. Typically, a catalyst has a high surface area and are commonly blended with proprietary compounds that allow the catalysts to facilitate reactions such as:

- amalgamations, hydrogenation, redox reactions, etc.
- organic chloride removal for catalytic reforming
- recover elemental sulfur in SRUs
- Gas to Liquids (GTL) refining
- inert gas purification

Featured Products

- Alumina SulCat for use in Sulfur recovery units (SRUs)
- AirFlo A MP for decomposing pollution in air
- ChloriClear A 235 removes HCl for catalytic reforming
- HydroFlo A PC for deoxidizing Hydrogen gas streams
- HydroFlo C for Steam Methane Reforming (SMR)
- Hydro SulCat for tail gas Hydrogenation in TGUs
- HYZSMS for Fluid Catalytic Cracking Units (FCCUs)
- HYZSMTG for methanol to gasoline (MTG) refining
- NitroFlo A PC for removing oxygen from Nitrogen gas
- Pseudoboehmite for Fluid Catalytic Cracking Units
- Pseudoboehmite for use as a catalyst base
- Super SulCat for hydrolyzing CS_2 and COS
- SulfuRyd A for removing sulfur from Hydrocarbons

Silica Gel

White, non-indicating

White silica gel is the most common form of silica gel for bulk dehydration, although it is not color indicating

- Beaded, 2-5 mm
- Granular, 2-5 mm
- Beaded, 0.5-1 mm



Blue and Yellow, indicating

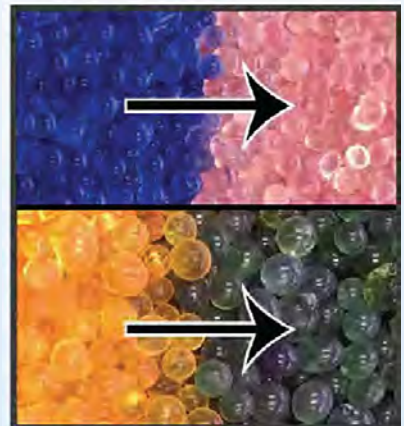
Indicating silica gel offers the user the ability to visually assess the remaining adsorption capacity.

Blue, indicates as Pink

- Beaded, 2-5 mm
- Beaded, 3-5 mm
- Beaded, 1-3 mm

Yellow, indicates as Green

- Beaded, 2-5 mm



Specialty Silica Gels

We also offer specialized products for various industries:

- HY-8 for turbidity reduction for malt beverages
- HY-H for natural gas processing
- HY-W for natural gas processing
- HY-CLC for chromatography
- HY-KL for cat litter

All of our silica gel products can be customized to fit your specific requirements including: pore size, particle form/shape, particle size, surface area, and more.

Product Information

Custom Products

Our facilities are capable of manufacturing products with physical and chemical properties that are fully customized to fit your specific requirements.

- Beads (spheres), pellets (extrudates), or powder
- Multiple mesh sizes including small beads (0.5 mm)
- Optimized physical and chemical properties
- Custom packaging options available

Inventory

We have inventory in Houston, TX; Omaha, NE; and Shanghai, CN. Our standard products may be available in small bags, drums, or Super Sacks. The products we stock and new packaging options can be added to fit the needs of our customers and market demand.

Shipping and Logistics

- we can arrange shipment options for any order
- competitive pricing, drop-ship options directly from our manufacturing facility
- most order processing in one business day

Packaging

- Molecular Sieve - drums or Super Sack options
- Activated Alumina - small bags or Super Sack options
- Catalysts - small bags or drums
- Silica gel - small bags or Super Sack options

Air Separation

Molecular sieves are used in a range of air separation, purification, and compression applications.

Pressure Swing Adsorption Technology

The selective adsorption properties of molecular sieves allow molecules from the air to be separated, creating pure streams of oxygen, hydrogen, nitrogen, and more. Pressure Swing Adsorption (PSA) is widely used in air separation plants and tends to replace the traditional cryogenic air separation because of its low investment, low energy consumption, and easy operation.

Product Options by Industry

Oxygen Production

- OxyFlo I - Type 13X, industrial Oxygen generation
- OxyFlo V- Type SA, industrial Oxygen generation
- OxyFlo NN- SodiumX, high purity Oxygen generation
- OxyFlo LD- LithiumX, high purity Oxygen generation

Nitrogen Production

- NitroFlo 2 - carbon molecular sieve
- NitroFlo C - activated carbon

Hydrogen Production

- HydroFlo V- Molecular Sieve
- HydroFlo A PC - Catalyst

Cryogenic Air Pre-Purification

- CryoDry 1 - Molecular Sieve

Desiccant Air Dryers

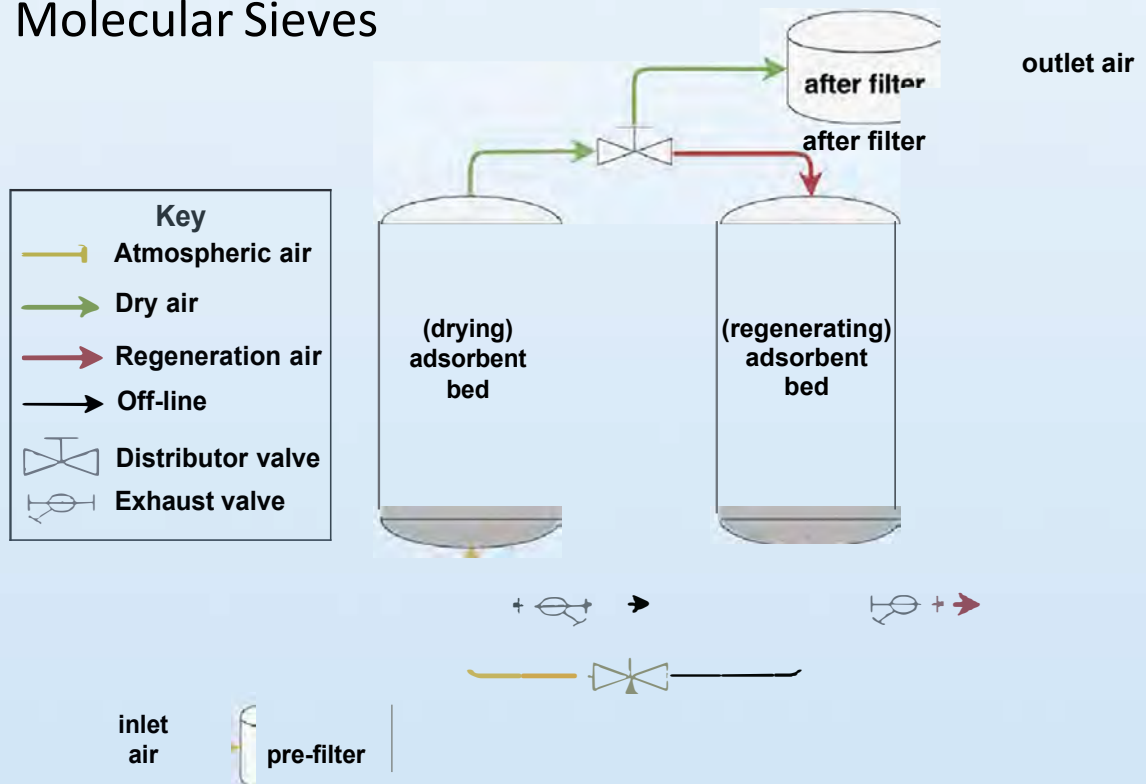
Desiccant dryers are used to dehydrate atmospheric air or pure gases including H₂, N₂, O₂, CO₂, for use in pneumatic equipment.

Why Dehydrate Air?

It is important for these gases to be purified and dehydrated before use to prevent corrosion and damage to machinery.

Featured Products

- Activated Alumina
- White Silica Gel
- Indicating Silica Gel
- Molecular Sieves



Natural Gas Processing

Dehydration, Compression, Cryogenics, Liquefaction, Peak Shaving, and Storage

WaterRyd adsorbents include: molecular sieve Type 3A, molecular sieve Type 4A, activated alumina, and silica gel. These adsorbents can dehydrate gas streams to levels under 0.1ppm.

Sweetening, Sulfur Removal

SulfuRyd adsorbents include: Molecular Sieve Type 5A, Molecular Sieve Type 13X, and Activated Aluminas. These adsorbents remove sour gas such as sulfurous compounds, mercaptans, Carbon Dioxide, and more.

Mercury Removal

MercurRyd adsorbents include: molecular sieve Type 3A and molecular sieve Type 13X. These regenerable adsorbents remove mercury from natural gas.

Nitrogen Rejection

NitroRyd adsorbents include: Molecular Sieve carbon and activated carbon. These products selectively separate nitrogen from hydrocarbon streams.

Hydrocarbon Dew Point Control

Silica alumina adsorbents for critical dew point control include: HY-H and HY-W. These products can alter the dew point of gas streams and allow natural gas liquids to be separated.

Sulfur Recovery

Sulfur Recovery Units

Sulfur Recovery Units (SRUs) are vital for many refining and natural gas operations. Many environmental regulations require sulfur to be recovered before tail gas is flared to reduce the amount of sulfur polluted into the atmosphere. The recovered sulfur can be used for an array of different purposes including fertilizer additives or in the production of sulfuric acid.

Tail Gas Units

Tail gas can be handled in many different ways, in some cases, it is sent to flare and any remaining sulfur compounds are incinerated. Tail Gas Units (TGU) can be used to further process the sulfur in tail gas to meet environmental and specification requirements. A TGU is used to convert residual COS, CS₂, and SO₂ found in tail gas into H₂S, which is then recycled to sulfur recovery units to be processed again.

Featured Products

- Alumina SulCat - high alumina SRU catalyst
- Promoted SulCat - promoted alumina SRU catalyst
- Blended SulCat - titanium dioxide blended catalyst
- Super SulCat - high titanium dioxide content catalyst
- Hydro SulCat - tail gas hydrogenation catalyst

Refining

Refining involves the restructuring a chemical feedstock into another form to increase its value in processes such as cracking, isomerization, and upgrading.

Isomerization

Before normal butane, n-pentane, and n-hexane can be isomerized, but water and sulfur must first be removed.

- IsoDry Series - Molecular Sieves

Hydrogen Purification

Formed as a byproduct in catalytic reforming processes, hydrogen must be purified before it can be used as a vital input gas in many refining processes.

- HydroFlo Series - catalysts and Molecular Sieves

Catalytic Reforming

Hydrogen chloride is a common chemical additive in catalytic reforming that must be removed to protect reforming catalysts in the system.

- ChlориClear Series - catalysts and adsorbents

Steam Methane Reforming (SMR)

Methane must have sulfur compounds, chlorides, and other contaminants removed before it can be used in steam methane reforming to produce hydrogen streams that will fuel other refining processes.

- HydroFlo C - catalyst

Petrochemicals

Basic Feedstock

Benzene, butadiene, ethylene, p-xylene, and propylene are basic feedstock for the petrochemical industry and can be used to create numerous intermediates that can be used to make chemicals, cosmetics, electronic parts, lubricants, plastics, and synthetic fibers.

Olefins

Ethene, propylene, butene, and butadiene must be purified before they can be used to create goods such as plastics, industrial chemicals, and synthetic rubber.

- OleCleanse - mixed olefin cracked gas purification
- EthylCleanse - ethylene purification
- ButylCleanse - butylene purification

Aromatics

BTX aromatics include benzene, toluene, and xylene. The compounds can be used to create dyes, detergents, and advanced polyurethanes for plastics and fibers.

- BTXCleanse - aromatic purification
- XyleCleanse - Xylene stream dehydration

Synthesis Gas (Syngas)

Composed of carbon monoxide and hydrogen, synthesis gas is an important source for making synthetic natural gas (SNG), ammonia, and methanol.

- SynCleanse - Syngas purification

Fluid Catalytic Crackers

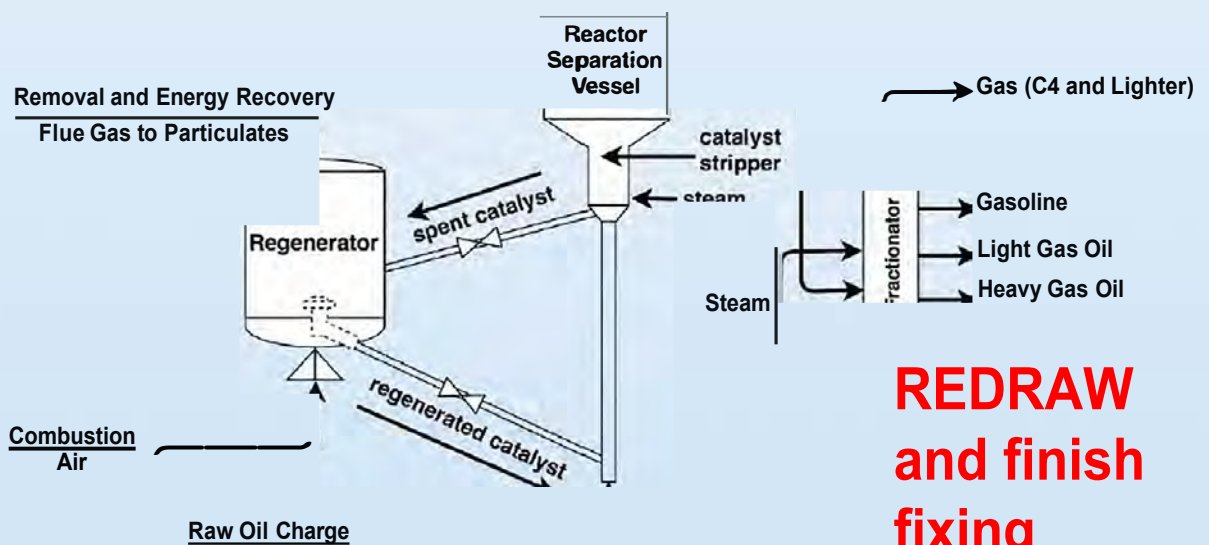
Fluid catalytic cracking (FCC) is used to break, or crack, large hydrocarbon chains into smaller chains that are suitable for use in gasoline blending. Fluid catalytic cracking units (FCCUs) are the most common of the catalytic cracking processes and involves a catalyst section and a fractionation section.

Adsorbents in FCCUs

Our FCC catalyst can be used to facilitate the cracking of heavy or vacuum gas oil (HVGO), which consists of large hydrocarbon chains, into shorter chains that can be used for gasoline blending. This cracking, under presence of a catalyst, increases the yield compared to traditional thermal cracking processes.

Featured Products

- HYZSMS
- Pseudoboehmite



**REDRAW
and finish
fixing**

Ethanol Dehydration

Ethanol has to be dehydrated to 99% purity or greater to be used as a fuel grade additive. Distillation alone cannot dehydrate ethanol to more than about 95% purity, so molecular sieve technology is applied to remove the residual water and produce a dry, high purity end product.

Adsorbents in Ethanol Dehydration Units

EthaDry is a Type 3A molecular sieve that is specifically designed for Ethanol Dehydration Units. This product offers an advantageous balance of crush strength and adsorption capacity while providing minimal ethanol coadsorption properties. EthaDry has a superior selectivity between water and ethanol molecules, which increases both efficiency and dehydration capacity each cycle to help plants meet production goals and maximize output.

EthaDry

We considered the conditions required by dehydration units to operate at peak performance and designed a molecular sieve with ideal physical properties and selectivity to optimize productivity.



Siloxane Removal

Removing siloxane is an important step in cleaning methane gases for use as fuel since siloxane is a form of crystalline silica that will essentially turn into glass when burned or combusted. The collection of combusted siloxanes inside of engine components can cause the buildup of heat, water, and other contaminants that can cause corrosion, leading to problems in the engine.

Adsorbents for Siloxane Removal

Hengye Inc. offers a suite of products that are suitable for removing siloxane from methane streams, collected from landfill gas. Silica gel is a common, reusable filter, that can clean methane by removing siloxanes and other contaminants and help support successful equipment operations.

Featured Products

- 13X Molecular Sieve
- Activated Alumina
- White Silica Gel

More about Biogas

Landfill gases are a large contributor to the annual emissions of greenhouse gases, the most detrimental gas being released is methane. This methane can be collected to protect the environment and also be used as a renewable fuel source.

A Global Manufacturer

In 2014, Hengye Inc. was established in the USA to meet the growing, dynamic adsorption needs in the American market. Our team provides a full range of services, including design work, bed sizing, technical support, optimization, turn around services, and more.

Feed streams are unique and the superior design of Hengye products can meet the industry specifications required to maximize the value of product streams. Our engineers and technical advisors will provide the data and education to support and bring confidence to those who use Hengye products.

Support Services

- Remote and on-site support available
- Dehydration unit optimization and operation analysis
- Design engineering and bed loading calculations
- Systems training and activities support
- Material application education and product selection
- Change out services and commissioning
- Analyze remaining working life of products
- Breakthrough testing, product performance analysis





Connect with us...

Hengye Inc.

11999 Katy Frwy, Ste 588
Houston, Texas 77079

Toll Free (844) 308-3271

Fax (832) 288-4230

Email info@hengyeinc.com



Hengye has been manufacturing quality adsorbents for over twenty-five years. Our molecular sieves and adsorbents are ideal for dehydration and purification processes and offer custom manufactured properties that help increase profitability and optimization. Our goal in creating these specialized adsorbents is to help plants and refineries flourish and increase output without needing to expand current operations. These products are built to withstand typical operation conditions when properly maintained and aim to provide a positive return-on-investment.