

Sorbead™ adsorbents

Extending moisture
control, product
quality and process
life cycles

 **BASF**

The Chemical Company

Reliable BASF Sorbead adsorbents play a dynamic role in a range of drying and other processes, such as:

- **Dynamic drying:** Temperature-swing and pressure-swing processes
- **Static drying:** Insulating glass, desiccant bags, and exsiccators
- **Drying filters:** Transformer dehumidifiers, coolant drying cartridges, and standard laboratory devices such as 'U' tubes



BASF Sorbead portfolio

Sorbead™ R is the standard within the BASF Sorbead product suite. It has the widest range of adsorptive drying applications as well as being economical to use. BASF Sorbead R is best suited for drying compressed air, gases, natural gas and liquefied gases.

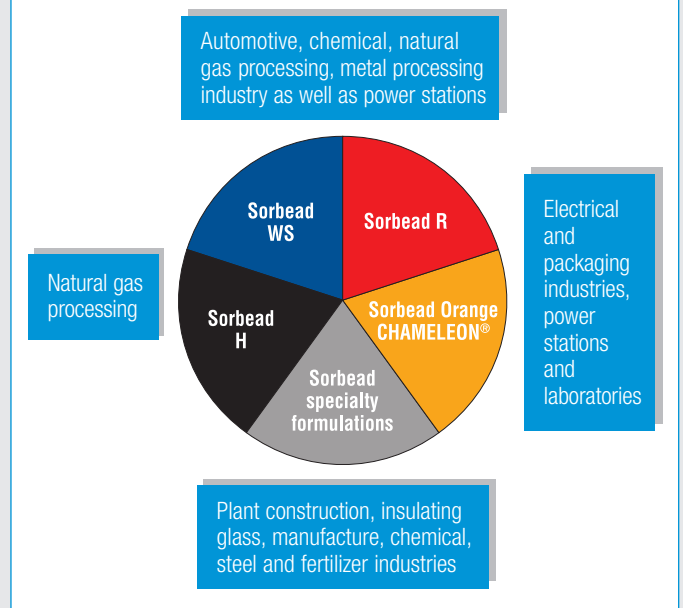
Its high capacity and low regeneration temperature demands make Sorbead R more effective and less expensive than other adsorbent options. Value-added benefits include:

- Above average drying capacity
- Durable and dependable with high mechanical strength
- Continued effectiveness even when regeneration is taking place with moist gas at relatively high temperatures
- Like other Sorbead products, Sorbead R can be regenerated by applying heat (approximately 100° to 160° C) or pressure swing

Sorbead™ WS is the only water-resistant, high-capacity, porous silica gel. It can be used in extreme operating conditions to control moisture, such as in heat-of-compression air dryers which provide the most energy efficient way of drying compressed air. More commonly, BASF Sorbead WS is added as a 20 percent protective layer to guard Sorbead R and Sorbead H against water attack, thereby, increasing the lifetime of these adsorbents even in the dampest environments.

When moisture monitoring is required, **Sorbead™ Orange CHAMELEON®** offers maximum process assurance. BASF Sorbead Orange CHAMELEON® is used in viewing windows in drying plants, transformer air-dehumidifiers and laboratories (i.e. drying towers, U-tubes, exsiccators).

Sorbead™ portfolio and various applications



An environmentally-friendly indicator, with enhanced functionalities based on patented CHAMELEON® technology, turns the Sorbead pearls from orange to translucent when humidity in the surrounding air has passed a certain threshold. However, it continues to adsorb water from this point until reaching its maximum capacity. When Sorbead Orange CHAMELEON® is regenerated, it regains its orange color and is fully functional.



In addition to drying natural gas, **Sorbead™ H** simultaneously recovers heavy hydrocarbons (C6+). These heavy hydrocarbons can condense and plug natural gas pipelines as well as other equipment, especially in combination with humidity. Adsorption with Sorbead H reduces the hydrocarbon and water dew point of natural gas to levels lower than achievable with most other technologies. As with other Sorbead adsorbents, it is regenerated by applying heat.

It is recommended to add a 10- to 20-percent protective layer of Sorbead WS to Sorbead H to protect it against liquid carry-over.

Customized Sorbead formulations

BASF can design and supply a variety of specialty Sorbead formulations to conform to specific production requirements. Grain size, pore volume, pore diameter, specific area and chemical compositions can be engineered into unique Sorbead pearls.

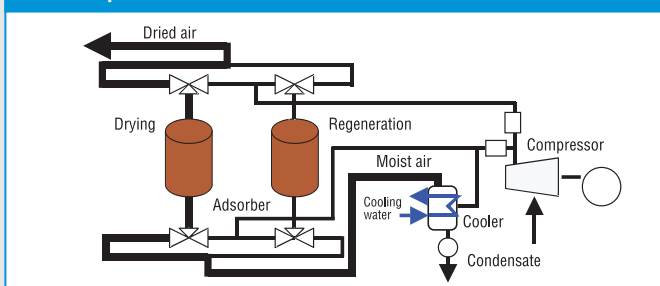
Examples of customized Sorbead formulations include:

- **Sorbead™ AF125 and AF25:** These aluminum-free grades are designed for drying acetylene and unsaturated hydrocarbons. Sorbead AF25 is added to a 20 percent protective layer of Sorbead AF125 which is water-resistant.
- **Sorbead™ 22:** An exceptionally hard adsorbent which is designed specifically to remove acetylene from liquid oxygen during cryogenic air separations. Its high attrition resistance brings down the generation of dust levels which can negatively impact air-separation plants.

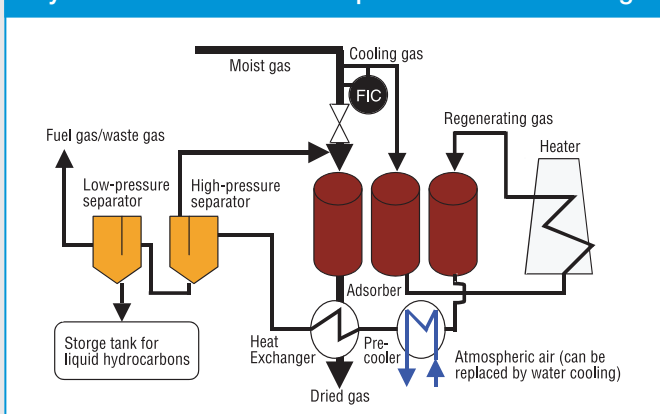
Depending on your business requirements, BASF Sorbead adsorbents are offered in a wide variety of packaging options:

- Silo truck
- Big bags
- Metal drum(s)
- Paper sack
- Pail
- Tin box(es)

Illustration of drying facility regenerating by using heat of compressor



Example of a 3-tower facility for simultaneous hydrocarbon and water dewpoint control in natural gas



Beyond products: Comprehensive technical services & services

More than high quality Sorbead adsorbent products, BASF offers a comprehensive suite of technical services. BASF makes it possible for companies of every kind to realize greater operational efficiency by testing, assessing and optimizing their drying processes. This assures that any renewal of adsorbent is only carried out when necessary – lowering operational costs.



Our technical services provide complete support and counseling on an extensive array of adsorptive drying challenges – either on-site or remotely.

Benefits include:

- Comprehensive support and advice for operating existing plants
- Assessment support in the planning of new drying units, particularly in the selection of appropriate adsorbents
- Sizing, from adsorbent inventory to fully operational plants
- Determining the optimum regeneration conditions to reduce energy consumption
- On-site supervision and service during fill-in, commissioning and startups
- In-house analysis of adsorbent samples, followed by technical recommendations

With superior design, diligent monitoring and regular maintenance, the potential operational lifetimes of adsorptive units can be fully maximized.

BASF – The name inside the solution

BASF Corporation is a surface and materials science company focused on technologies that dramatically improve products and processes.

- **“One-stop,” integrated resource** furthers our ability to develop and customize products rapidly and cost-effectively within a sound scientific framework. While our roots are in science, our success comes from blending technology and ingenuity in a way that continues to raise the bar and drive innovation—for both our company and our customers.
- **Our global infrastructure** allows us to serve our business customers regardless of their location – with state-of-the-art manufacturing facilities, comprehensive technical support, superior distribution channels and an experienced and dedicated global sales force.
- **Research and development** centers strategically located in the U.S., Asia and Europe position BASF to address the unique local requirements of businesses and industries around the world.

At BASF, we believe it is absolutely essential to deliver solutions that provide lasting business value. Working closely with our customers and their customers is one of our fundamental value propositions.

With years of experience in developing top-quality, active moisture-control technologies for a wide variety of industries, BASF is ready to assist in meeting your specific business requirements.

To learn more about how BASF Sorbead products and services can help you optimize your drying processes, please visit us at www.basf-catalysts.com.

Sorbead™ adsorbents provide maximum protection...

. . . against the damaging and costly effects of moisture in gases, pipelines and process equipment – a critical concern for many industries. Moisture can significantly compromise the safety of a plant’s operations and undermine the integrity of valuable products. BASF has a rich legacy of enhancing our customers’ products and processes to improve maximum safety and optimal product quality.



Destination: BASF

For more than 50 years, BASF has led the way in helping businesses and institutions across industries meet and exceed stringent moisture control standards. We offer a variety of superior technologies that underscore our company’s reputation for delivering ingenious answers to tough business challenges. A vertically integrated business, BASF controls every aspect of our product’s development – from sourcing and design, to packaging and quality control. We offer a seamless, highly reliable service channel that leverages the skills, knowledge and technologies residing throughout the organization.

At BASF, we’ve made it our business to adapt our products to meet the needs of our customers. Our innovative spirit, pioneering technologies, deep industry knowledge and rigorous standards drive every product we supply. We collaborate closely with our customers and regularly convene with other businesses and universities to exchange ideas and share expertise.

Patented BASF **Sorbead™ adsorbents*** come in a range of sizes and physical characteristics to fit any manufacturing environment. Their longer life reduces operating costs while their high performance enhances the operating safety of pipelines, chemical manufacturing plants, natural gas treatment plants, electrical power stations and metal processing plants, among others.

Sorbead products can be found hard at work in companies that utilize or produce air or compressed air, treat natural gas or industrial gases and in a multitude of various fluid or gaseous process flows. By cost-efficiently minimizing moisture, condensation, plugging and icing of these operations, BASF Sorbead adsorbents reduce unwanted by-products, enhance end-product quality and extend process plant life cycles.

As indicated in the chart on the right, BASF Sorbead offers a myriad of tangible benefits to our customers looking to resolve drying challenges.

(*In Europe, Sorbead adsorbents are also known by the registered trade name KC-Trockenperlen®)

Properties	Benefits
Low regeneration temperatures from 90°C	Reduced energy consumption and minimal hydrothermal aging lowers operational costs.
Bead shape	High abrasion resistance and low pressure drop reduces energy and operational costs.
Long-life	Decreased adsorbent replacement expense enables lower service and operational costs.
Large specific surface area	High adsorption capacity, drying performance and low pressure dew points (minus 70° C) are characteristic of Sorbead.
High bulk density/high loading capacity	Users can reduce their plant size or can increase the capacity of their existing equipment. Sorbead can yield substantial savings in both construction and operational costs. Longer regeneration cycles add to operational benefits.

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