

UOP Polybed™ Pressure Swing Adsorption (PSA) Systems

Pressure Swing Adsorption systems for gas extraction and purification

Description

The Pressure Swing Adsorption (PSA) process is based on the principle that adsorbents are capable of selectively adsorbing impurities. The impurities are adsorbed in a fixed-bed adsorber at high pressure and desorbed by “swinging” the adsorber from the feed to the tail gas pressure and by using a high-purity purge. Typically the desired component is not adsorbed and is recovered at high purity.

Operation

UOP’s Polybed PSA systems are designed to be safe, efficient, and economical. A PSA system operates as a batch process; however, multiple adsorbers operating in a staggered sequence are used to produce constant feed, product, and tail gas flows. Regardless of the number of adsorber vessels, all Polybed PSA systems follow the five-step pressure-swing cycle. The red area represents the impurities, and the blue area the product.

Commercial Experience

Since commercialization in 1966, UOP has provided more than 1000 PSA systems in more than 70 countries. These systems have found application in the refining, petrochemical, polymer, chemical, steel, and power generation industries. The Polybed PSA system has demonstrated exceptional economic value in many applications, such as recovery of hydrogen from refinery off-gases, recovery of monomers in polyolefin plants, extraction of hydrogen from gasification syngas, purification of helium for industrial gas use, adjustment of synthesis gas for ammonia production, purification of methane for petrochemicals production, and H₂/CO ratio adjustment for syngas used in the manufacture of oxo-alcohols.

Feed conditions typically range from 100 to 1,000 psig (7 to 70 kg/cm²g), with concentrations of the desired component from 30 to 98+ mol%. System capacities range from less than one to more than 350 MM SCFD (less than 100 to more than 390,000 Nm³/h).

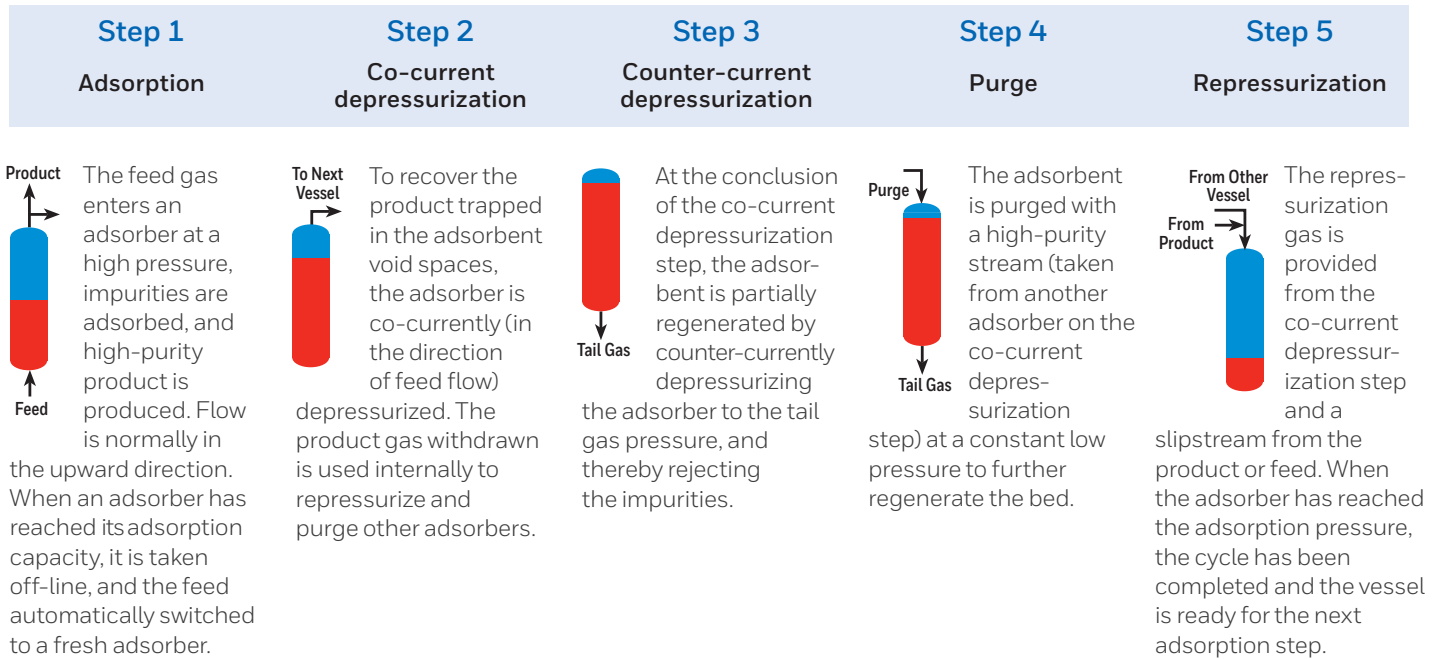


Proven effective and reliable technology to achieve your gas separation and purification needs.

FEATURES & BENEFITS

UOP’s Polybed PSA system offers:

- High reliability (greater than 99.95% on-stream time)
- Minimal manpower requirements due to automatic operation
- Reduced equipment costs and enhanced performance based on high performance adsorbents and advanced PSA cycles
- Lower operating and equipment costs for downstream process units due to the availability of a high-purity product gas
- Flexibility to process more than one feedstock and maintain product purity and recovery during changing conditions
- Minimal feed pretreatment and utility requirements
- Long adsorbent life (>30 years)
- Reduced plot requirements, fast delivery times, and low installation costs based on the modular design
- Worldwide service and support



UOP Provides:

- Optimized integration of PSA technology within your plant
- Improvements to existing technology to meet your changing process needs
- New applications to meet your new challenges
- Unparalleled international experience in project development, engineering, fabrication, and technical support
- Flexibility in project execution
- PSA systems optimized to customer requirements
- Worldwide sourcing to meet local requirements
- Fixed pricing for accurate forecasting of project expenses
- Shop fabricated skid-mounted systems for fast on-site installation and start-ups
- Superior quality control resulting in long-term safe, reliable operation
- Proprietary UOP adsorbents that enable superior performance
- Automatic operation that minimizes manpower requirements
- Maximum production reliability due to control systems that automatically adjust to maintain production, even during upset conditions
- Lower capital cost due to adsorbent efficiency, process design and control philosophy
- Products and services with ISO-9001 certification
- Ongoing technical services and support after startup
- Information on the latest developments and advancements in our technology through seminars and conferences
- Proven training programs
- Revamp services to enable existing equipment to meet your future needs

For more information

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