



APPLICATION DETAILS

Molecular Sieve units are a Pressure Swing Adsorption System used for the dehydration and purification of natural gas. They are installed where natural gas is required as feedstock for refineries, LNG regasification, petrochemical plants, power plants, pipelines, air separation units, ammonia production, and extracting NGL.

Natural gas dehydration is essential for restricting hydrates from forming and causing corrosion. Natural gas purification is necessary for ensuring finished product quality.

The process involves a minimum of two molecular sieve beds containing an adsorbent (often Zeolites) through which natural gas is continually passed. Each bed has a set of switching valves frequently cycling between the adsorption and regeneration stages. During the adsorption process, high pressure gas is passed through the molecular sieve bed until the adsorbent is fully saturated by water and/or impurities allowing the pure, dry natural gas to slip through. The molecular sieve bed is then regenerated with temperature swings and regenerative gases releasing the trapped water, CO₂, and liquid hydrocarbons.

APPLICATION CONSIDERATIONS

HIGH CYCLE	Valve cycling may exceed 60,000 cycles a year.
TEMPERATURE FLUCTUATIONS	Frequent and rapid temperature cycling from 392°F to 800°F during the regeneration cycle.
PRESSURE FLUCTUATIONS	Frequent and rapid pressure cycling between 580 psig to 1450 psig during the gas and regeneration in/out cycles, pressurizing, and depressurizing cycles.
EROSION	Abrasive catalyst and bed residuals may escape the catalyst beds.
TIGHT SHUTOFF	Tight shutoff is required for maintaining gas quality and catalyst performance.
FUGITIVE EMISSIONS	Low emissions required for safety, environmental, and health considerations.
CORROSION	Process inefficiency can lead to a corrosive environment through the formation of hydrates and acidic contaminants.
LIMITED MAINTENANCE	Typically valves in this service are required to perform flawlessly for a minimum of 5 years between maintenance cycles.

MOLECULAR SIEVE

TRICENTRIC® TRIPLE OFFSET



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The TRICENTRIC® triple offset butterfly valve's non-rubbing, metal to metal, torque seated design, and material selection combine to provide a custom, economical and compact solution to meet the extreme requirements of molecular sieve applications while delivering high efficiency, reduced downtime, and capital expenditure.

TRICENTRIC® TRIPLE OFFSET MOLECULAR SIEVE CONFIGURATION

The TRICENTRIC® triple offset butterfly valve can be customized to suit any molecular sieve application. The below description is an example of a typical configuration.

FEATURES

- › Standard materials of construction include A216 WCB body, A216 WCB disc, 17-4 PH DH1150 shaft, 316 SS trim components optimized for high pressure and temperature fluctuations
- › Duplex 2205 and graphite laminated seal ring for tight shutoff and abrasion resistance
- › Graphite bearings for CL150 or Stellite® 6 bearings and thrust bearing for >CL150
- › Braided graphite bearing seals or optional energized seals
- › Graphite low emission packing (100 ppm) and optional live loading
- › Zero leakage to API 598, resilient seated, high and low pressure, shutoff
- › Stellite® 21 seat overlay or higher alloy to suit application for abrasion resistance
- › Design considerations for material selection, dimensional clearances, and tolerances are selected to meet the application temperature range and thermal transients



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