AFS MOLECULAR SEALS

The Molecular Seal AFS Series is located just below the flare tip and has been designed to prevent air ingress to the flare riser thus preventing the formation of an explosive mixture in the system.

The seal is a gas inversion device causing the gas normally flowing in an upward direction to be turned through 180 degrees in the original direction of the flow.

In a static condition, gases lighter than air will tend to collect in the upper bend sealing off the stack against the back flow of air. Heavier gases will tend to settle in the lower bend with the same effect. Some wind and atmospheric action will affect these interfaces slightly, and molecular diffusion of the two gases will take place at the interface. In order to counteract these effects a small continuous bleed of gas, dependant on the flare nominal diameter, must be maintained in order to ensure that air does not penetrate the seal.

FEATURES

- Molecular Seals have a safety factor for momentary loss of purge gas
- Lower purge gas rates
- Cost saving on purge gas
- No maintenance required
- Robust construction
- Molecular Seals can be used as a support for a flare tip lifting davit

DESIGN FEATURES

Flare stacks are designed to dispose of flammable gases safely by ensuring the combustion of these gases at the exit of the stack (flare tip). It is undesirable to have a flarestack filled with a mixture of gas and air (oxygen) within the flammable limits because of the dangers of internal flash-back or explosion.

Normally when a stack is in a shut down condition, unless special arrangements are made, the safest course is to assume that it is full of air. Subsequent introduction of a combustible gas means that at some stage, as the gas displaces the air, a flammable mixture will result. In order to prevent a dangerous situation arising, it is possible either to ensure that no ignition source is present during this period, or to replace the air with gas rapidly to preclude the danger of flame regression into the mixture.

The most common and most acceptable safety measure is to purge the system with a non-flammable gas prior to introducing the combustible gas, thus injecting a barrier between the two active agents. If the period between starting the purge and introducing flammable gas is to be prolonged a reasonable course of action is to include in the system a device which assists in keeping air from the stack, whilst reducing the amount of purge gas needed to accomplish this. The use of such a device is also advantageous when it is necessary to keep a flare on stand-by but not operating for a long period, when saving in purge gas will pay for the capital outlay on the device.