

LEAN AMINE FILTRATION IN A NATURAL GAS PROCESSING PLANT

Raw natural gas usually contains various contaminants which mainly consist of acid gases (CO_2 , H_2S , etc.), water, other gases (nitrogen, helium) and mercury. In this particular process, raw gas was first fed into a three-phase separator, where gas was separated into sour gas, condensate, and water condensate respectively. After proper filtration treatment, the condensate was then sent to a condensate stabilization plant and then was fractionated into sales LPG/gasoline. The water was purified with proper treatments in a water treatment plant, meanwhile, sent to a stripper to recover hydrocarbon carried over.

Sour gas first flows through an amine absorber where CO_2 , H_2S are removed by lean amine. Rich amine then flows into a regeneration column, where acid gases are released into a claus unit and the lean amine is regenerated and recycled. Following the amine absorber, there is a dehydration unit where sweet gas is dehydrated by using MEG. Dry gas is then sent through a fractionation column where condensates are sent to fractionation plant, and sales gas will be transferred through transmission plant. Meanwhile, rich MEG needs to be regenerated by a stripping column. However, rich MEG contains traces amount of rust, dust and solid particles and must be removed prior to the Stripper column, otherwise, it will cause corrosion of re-boiler.

After evaluating this process and reviewing the spec sheet provided by the client, Pentair recommended and provided a particle separator; ProcessOR and an AdsorbOR which were sized to fit the application. As indicated in blue in PFD above, a pre-filter with 25um rating is applied to remove large particles to protect Activated Carbon bed (AC bed), which is for removing color and odors in lean amine. A 10 um rating ProcessOR is positioned after the AC bed to remove active carbon powder carried over if any.

