

Gas Field Policy 12: Acid Gas Application

Acid Gas Compressor Applications typically involve the compression of flare gas from oil field amine regeneration systems, but these Guidelines can be applied to any similar gas stream. Normally "Acid Gas" contains 50 - 100% H₂S and CO₂ with minor amounts of other common gas field gases and is saturated with water vapor. It is important to have an accurate gas analysis and definition of the full range of operation pressures and temperatures. Also see: GFP-16 Carbon Dioxide Service (With H₂O) and GFP-18 Sour Gas Service.

The following guidelines must be met before a Siemens Energy Compressor can be offered for an Acid Gas Application.

1. All sizing and performance must be reviewed and approved by Siemens Energy HSRC Group prior to quoting.
2. Due to the high specific gravity of Acid Gas, rotative speeds 90% or less than design RPM are preferred.
3. Gas cooled cylinders are preferred but water-cooled designs are acceptable. If a circulating water system is utilized, care must be taken to keep temperature at least 10 deg. F above inlet gas temperatures.
4. Siemens Energy standard cast iron and nodular iron cylinder materials (ASTM A278 Class 40 (Gray Iron) and ASTM A536 (Ductile Iron) Grade 65-45-12 or ASTM A395 (Ductile Iron) Grade 60-40-18 are acceptable up to rated pressures. Forged steel cylinders must use "sour gas" billets. Non-lubricated applications are limited to < 1000 PSIG max.
5. All pressure packing and wiper packing cases should be of purged design.
6. Packing rings should be DW173 with CI pressure breaker and backup rings as necessary. Non-lubricated cylinders should use PEEK packing rings. All piston rings and/or rider rings should be DW173 material.
7. HOS and HOSS compressors may require an extra long distance piece. MOS cylinders require an added distance piece. All distance pieces must be sealed and either purged or vented to a safe area. Slings may be provided which will require extra-long distance pieces.
8. Please refer to GFP-16 for special consideration with regard to cylinder lubrication.
9. Compressor valve springs should be Elgiloy. Where steel valve seats and guards are standard, they should be changed to stainless steel. A "Dynamic Valve Analysis" is recommended to ensure proper valve action on each application. Valve lifts reduced from standard may be required. Valve seat gaskets should be soft iron or aluminum.
10. Piston rods should be age hardened 17-4 PH stainless steel with full length TC3 coating through the packing and scraper rings.

11. VVCP, FVCP, etc. are acceptable methods of capacity regulation. Any vents should be piped to a safe place.
12. Other optional features that should be considered:
 - a. Stainless steel LO piping downstream of frame LO filter.
 - b. Sour gas studs and nuts for components in gas stream.
 - c. Torsional analysis of compressor/motor driver system.
 - d. Compressor flywheel if required by torsional analysis.
13. In addition to the compressor itself, there are many special requirements for the packaged unit components for Acid Gas Compressor Applications.