

Purge and Vent Systems

Ariel provides suitable materials options and configuration options for a successful packing vent system. Much of the success of a packing vent system falls on the End User and Packager for design of the packing vent system and the End User for operations and maintenance of the system.

Options

Materials options are available for key components in the gas stream for sour and corrosive gasses. Materials options for components such as piston rods, valves, cylinder bolting, bearings, tubing and tube fittings are discussed in the <u>Ariel Sour Gas</u> topic.

Configuration options are available including <u>purged pressure packing cases</u>, <u>short</u> and <u>long two compartment</u> <u>distance piece</u> arrangements, flushing oil system and separate lube oil arrangements for the cylinders. These are discussed in the <u>Ariel Sour Gas</u> topic.

When a long two compartment distance piece and purge packing is purchased the intermediate and wiper packing cases come with purge rings and purge gas connections. These are available for incorporation into the system design.

The KBE:K:T and KBZ:U are not offered with a short two compartment option. The long single compartment design incorporates a purged wiper seal set when purged packing is purchased.

Refer to the <u>Packager Standards Section 8 Packing and Distance Piece Vent Systems</u> for further information and schematics on this topic.

Packing Leakage

Piston rod packing is designed to seal against cylinder pressure, but are dynamic seals and will have some leakage. This leakage will increase over time due to wear of the non-metallic sealing rings. The packing case is made up of several seal sets, each seal breaking down the pressure further than the last. In the new and broken in condition packing rings will leak some gas. The leakage rate will depend upon the condition of the packing and to some extent the use of a purge gas (see <u>purge packing</u>).

Packing in the new and broken in condition will leak 5-10 SCFH through the vent with 2-3 SCFH entering the distance piece. Prior to break in leakage will be higher.

When purged packings are employed the packing will leak 8-13 SCFH through the vent due to the addition of the purge gas and 3-5 SCFH of purge gas entering the distance piece. The purge gas demand will be roughly 5 SCFH.

As the packing wears out vent leakage will increase to as high as 120-180 SCFH (2-3 SCFM) and purge gas may increase up to 30 SCFH to maintain a positive pressure over the vent pressure. Likewise, distance piece flows will increase respectively.

Upon shutdown of the compressor packing leakage will continue, and increase, unless cylinder pressures are relieved.

Refer to the <u>Packager Standards Section 8 Packing and Distance Piece Vent Systems</u> for further information on vent systems.

Purged Packings

Purge packing refers to a packing case modified to accept an external purge pressure 15 to 20 psi above the primary packing vent/drain pressure with no more than 5 psi external system back pressure. The purge gas must be sweet natural gas or an inert gas, such as nitrogen. The purpose of purge gas is to block and contain

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hazardous, toxic, flammable or corrosive gases, and to prevent such from entering the compressor frame where damage to the running gear, or personnel safety hazards can occur.





Packing case materials are cast iron and steel. When steel is used, it is heat treated to be in compliance with NACE. Garter springs are 316 stainless steel, for both sweet and sour applications (acceptable for sour service based upon acceptable field experience).

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