Vapour recovery unit compressor

Hooman Tabaraei
Specialist Process Engineer (MIChemE, CEng)

Does anyone know the reason of using of oil or water in compression of low pressure (nearly atmosphere) gas in vapour recovery unit compressor, in oreder to increase the pressure up to 2barg or slightly more? I appreciet you share the relevant references.
Thanks

Unfollow Hooman

Like • Comment (4) • Share • Unfollow • Reply Privately • December 22, 2012
Add to Manager's Choice • Close Discussion

Comments

4 comments

Afshin

Afshin Khamisabadi
Lead Process Engineer at MMC Oil & Gas

Dear Hooman,

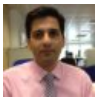
Refer to below link, which explain why liquid is necessary.

psscorp.co.th/upload/news/2011082641330.pdf

Afshin

Like (2) • Reply privately • Delete • December 23, 2012

Hooman Tabaraei, S M Kumar like this



Saeid R. Mofrad
Principal Process Engineer at Petrofac (P.E.)
Top Contributor

Liquid Ring Compressors are typically limited to the following ranges of capacities and discharge pressures.

- Single stage : 10-10,000 m3/hr at suction and 0.5 barg at discharge
- Two stage : 10-1000m3/hr at suction and 5barg at discharge
- Multistage: 50-200 m3/hr at suction and up to 12 barg at discharge

Above limitations don't let them be powerful competitors for the centrifugal compressors; however they have been used in the following industrial applications, so far:

- Refinery gas desulfurization plants
- Off gas recovery plants
- Flare gas recovery units
- Tank vapor recovery units
- Solvent recovery plants
- Monomer recovery systems
- Ozone compression
- Hydrogen peroxide compression

This is because one or more of the following features, that this type of compressor offers, is favorable for the service:

- Virtually no gas temperature rise especially when the gas tends to polymerize or otherwise react

under rising compression temperatures
• High operation safety - very suitable for explosive gases
• Low noise
• Environmentally friendly operation
• When oil free compression is required
• For applications requiring tolerance to liquid carry over
• For corrosive services
• Low wear and reduced maintenance costs
• Reduced operation down time
• Investment cost savings

Delete • December 30, 2012

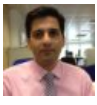
Hooman Tabaraei likes this

Hooman

Hooman Tabaraei
Specialist Process Engineer (MIChemE, CEng)

In our study we're investigating the replacement of water with oil inside liquid-ring compressor. Vendor has proposed to utilise water inside the liquid-ring compressor, due to material of relief gas, however by replacing it by oil, size of cooler, and pipe lines seem to become less. These are our evaluations, and every thing inside VRU (vapour recovery unit) need to be confirmed by vendor. I appreciate you share your experience on liquid type selection inside compressor of VRU.

Like • Reply privately • Delete • December 31, 2012



Saeid R. Mofrad
Principal Process Engineer at Petrofac (P.E.)
Top Contributor

Dear Hooman,

Though using any liquid in this service is theoretically acceptable, however, there are lots of reasons why water has been so popular:

1. The compression ratio and resultant discharge temperature of this type of compressor is not high. So, the liquid temperature won't be so high (maximum 80-85C). This means that having oil in place of water does not offer much as you don't need very high temperatures where the oil can be an option.

2. If you limit the discharge (liquid temperature) to 85C, since the water has very high CP than any other liquid in the nature, so the size of circulation will be minimized with water.

3. Water will be carried away with process fluid which is usually acceptable. But you have to careful about contaminating process fluid with a liquid other than water.

4. Compressor sealing liquid will be lost during operation. Water at the proper pressure and quantity is readily available in most of the plants. But with oil you need a dedicated system (may be a small tank and pump) to make up the oil which is not economically attractive.

Let us know if you have received any update from vendor.

Delete • January 5, 2013

Hooman Tabaraei likes this

Add a comment...

Send me an email for each new comment.

Add Comment