걸우트레이딩 1984

Pipeline Drying

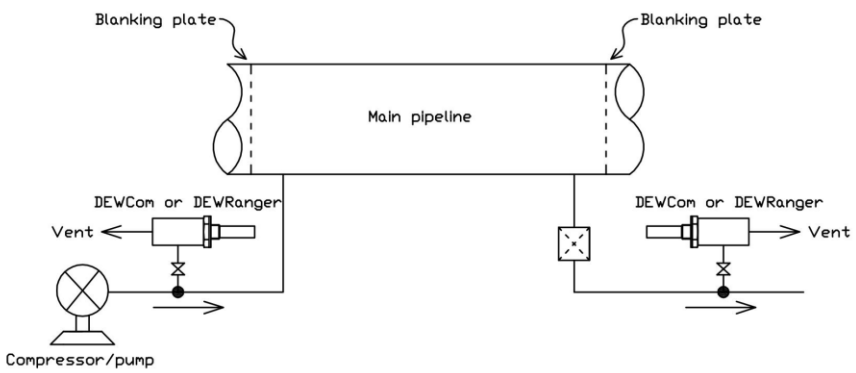
Process pipelines (and chemical vessels) which operate at elevated pressures need to be tested for the integrity of their construction and for leaks during commissioning and periodically during use. There are several methods of conducting this pressure test. The most common method is to shut off the section to be tested and pressurize it with liquid water. This is the simplest, safest and most economical method. Gas can be used to pressure test a vessel, but it is less commonly used because of its high compressibility which would be very dangerous if a leak or fracture developed in the pipeline during testing.

The problem with using water is that it leaves the pipeline wet after the test: This has two effects, first that the corrosion of the pipe or vessel will be accelerated and second, that the gas or liquid which the pipeline is to carry may be contaminated by the water. So it is common practice for the pipeline to be dried after the pressure test before it is put into operation.

There are three methods of drying the pipeline, each of which is easily monitored using a **STORK** hygrometer.

1. Hot Air Drying 열 풍 제 습 방 식

The pipeline is fed at one end with a supply of heated air from an air compressor. Heat energy is absorbed by the water in the pipeline which speeds evaporation. The water vapor is transported by the flowing air out of an exit port located at the opposite end of the pipe to the hot air entry.



A **STORK DEW*Com*** or **DEW*Ranger*** located at the air outlet indicates completion of the drying process by showing that the

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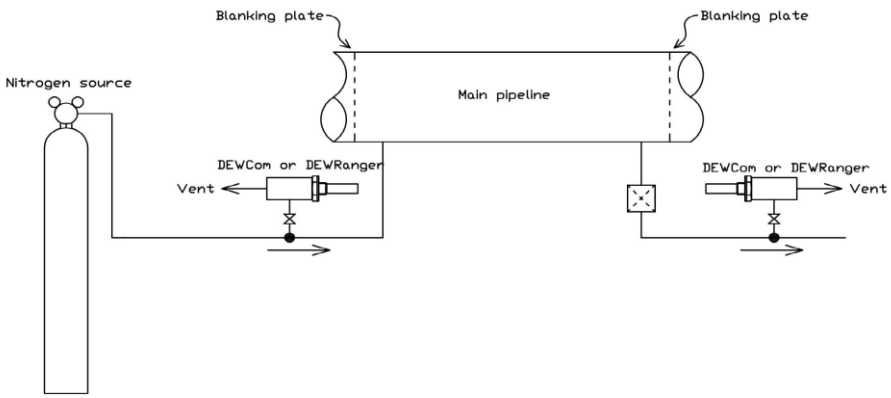
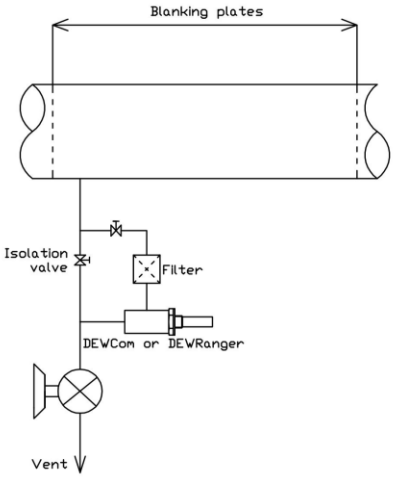
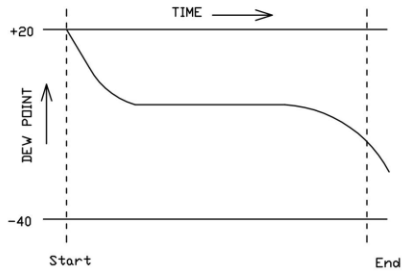
dewpoint has fallen from its starting value. During the process the air will be close to saturation at the prevalent ambient temperature. When the pipeline is dry, the dewpoint will reduce towards that of the feed air from the compressor.



2. Nitrogen Purge Drying- 질소를 이용한 제습방식

Instead of using hot air, dry air or another gas, such as nitrogen, may be used. Two advantages of using nitrogen are that. As delivered by the supplier, this gas is very dry and so has a high capacity for water adsorption and also that it is inert and can be used to prepare pipelines or process vessels that will later contain explosive or flammable gases.





The same procedure is used as in hot air drying above, often the differential dewpoint between the inlet value and the outlet value is used as an indicator of pipeline dryness. It is common for a differential of 5°C dewpoint to be used as the signal to end the drying process.

3. Vacuum Drying- 진공방식의 제습법

In this method the pipeline is completely sealed and then a single port is connected to a high power vacuum pump, which extracts air from the pipeline. Over a period of time, the humidity level in the outlet will reduce as a stable vacuum level is formed.

There will be a period where the dewpoint level stabilizes as residual liquid water is evaporated and extracted. When all the water has been removed, the dewpoint will drop again and this signals the end of the vacuum purge process. A **STORK DEW*Com*** or **DEW*Ranger*** mounted at the vacuum inlet port give a rapid indication of the end point.

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