



Greenlane Biogas: 4" Hy-Grade



CGIS.CA

The World's Best Valves®

2017 | Martin Sampson

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Background

Greenlane Biogas design biogas upgrading plants. The company uses a water scrubbing and pressure / temperature absorption gas cleaning process to produce renewable natural gas (RNG) from biogas and landfill gas. (Fig.1) Carbon dioxide and hydrogen sulphide are separated from the raw biogases under pressure by absorption into the water. After upgrading, the methane content is typically greater than 98%. This methane is then used for industrial uses, vehicle fuel or natural gas pipelines. Greenlane have 5 different sized modular plants operating all over the world.

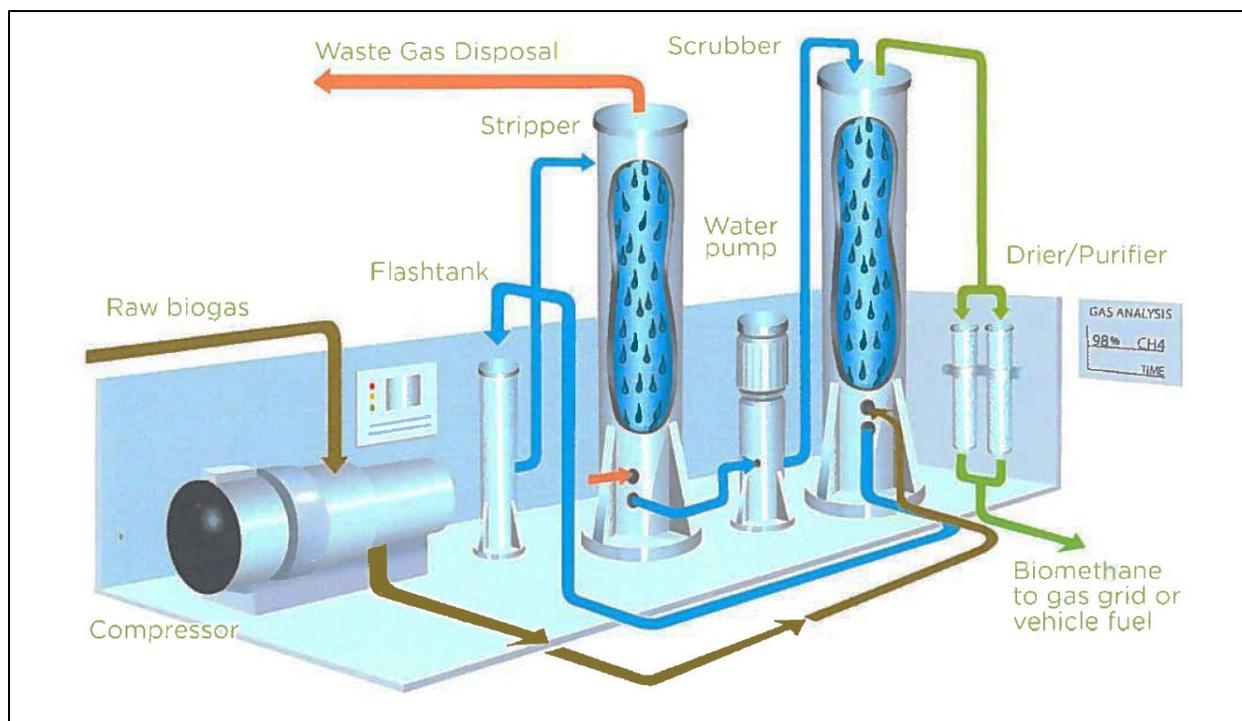


Figure 1: Basic Design Layout.

At the heart of the process is a simple, robust compressor. Worldwide, Greenlane use a Ro-Flo model 219M rotary vane compressor (Fig. 2). There are two compressors in series, 1st stage (Fig. 3) and 2nd stage (Fig. 4). Outlet is a 4" flange. Check valves are mounted directly to studded outlets on both 1st and 2nd stages.

The Problem

Durabla Fluid Technologies (DFT) center guided ALC check valves were used, sized simply based on pipe diameter. Shortly after installation springs failed and check valve components were found in the 2nd stage compressor resulting in a costly downtime and maintenance repair. The next valve used was a Gestra model RK86A. Although a different design than the ALC, it sealed well for a period of time but the valve experienced severe chattering. The chattering was a result of the check valve not being sized for the flow conditions and the application. Although it lasted longer than the ALC valve, failure was inevitable as a result of the chatter induced wear.

The Solution

CGIS was given the opportunity to quote 2 systems, each having 2 x 4" valves. Delivery was critical. Client was impressed with the tilted seat design of Hy-Grade, thereby eliminating the spring that has caused frustration in the past with other designs. Based on CGIS inventory and Greenlane's immediate need, Hy-Grade's metal seated T01's were purchased. Concern for a design with spring arrangement was a non-issue since Hy-Grade's dual-wound torsion spring arrangement is more robust than springs used in other designs. The first two valves installed on the 2nd stage compressor passed. It was decided to incorporate a soft seat into the AT design for valves on backorder with the factory. Standard valve of choice is now AT01-04G-6FF. Data sheets are provided by Greenlane to have each Hy-Grade sized for both staged flow rates. Greenlane in Burnaby Canada was convinced this was/is the valve for future designs. The end user and Greenlane's international team were a bit more skeptical. They didn't think the valve would last but a few days. New AT01 with soft seats have been in service in Colorado since January 2016. To date, August 3rd, 2016, 13 valves have been installed with orders in house for 15 more.

