

# SCR with BLACKMER COMPRESSORS

Glenn E. Webb  
Blackmer  
1101 S. Portland  
Oklahoma City, Ok 73108  
E-mail: webb@blackmer.com  
Ph. 405-942-6622  
Fax 405-942-2855

Blackmer has been building compressors for anhydrous ammonia and propane transfer since 1980. We are recognized worldwide as a major manufacturer of equipment for the transfer and vapor recovery of anhydrous ammonia, and a wide range of liquefied gases.

Blackmer offers a wide range of true “Industrial Duty” oil free compressors that will meet the demands for safe, reliable, efficient bulk transfer and vapor recovery in SCR-NOx reduction systems.

Our engineering and applications technical support group can help you select the proper equipment for your SCR application. We have over 100 years of combined experience applying liquid transfer and vapor recovery compressors in unloading systems. Through worldwide distribution or direct contact with our compressor division in Oklahoma City, we will be there to support your needs.

## HOW DO YOU USE A COMPRESSOR TO MOVE LIQUID?

Use of a compressor instead of a pump to transfer liquid from rail cars can be done faster with less noise, less maintenance, and because the compressor can empty all of the liquid and recover most of the vapor, it is much more efficient. Simply stated, the compressor draws vapor from the storage vessel and boosts the pressure about 30 psig (2bar-g) into the top of the rail car that you want to unload. The increased pressure in the rail car and the slightly decreased pressure in the storage tank results in a pressure differential between the two tanks that will easily push the liquid from the rail car to the storage tank. The compressor will continue to push all of the liquid out until the liquid level falls below the dip tube in the rail car. The result is a fast quiet transfer with no NPSH or pump cavitation problems.

At this point the compressor really begins to shine. After blocking the liquid line and reversing a four-way valve, the compressors suction and discharge piping and flow are reversed. This starts the removal of the “liquid heel” and then begins the vapor recovery process. The compressor will begin to remove vapors from the rail car vessel causing the “liquid heel” to boil off into vapor until the entire liquid heel is removed. At this point only vapors are remaining in the vessel. The vapors continue to be removed until the rail car pressure drops to the 25-50 psig (1.7 to 3.4 bar-g) range, or about 25% of the tank car’s normal vapor pressure.

By transferring all the liquid and most of the vapor, a Blackmer compressor can recover about 98% of the rail car's total capacity – far beyond the 88% a pump typically recovers.

## SIZE AND SELECTION

Two Blackmer models are well suited to most NH<sub>3</sub> transfer operations. The HD362-LC is a 15 hp unit that will provide flow rates from 160-180 gpm (600-680 lpm). A larger model HD602-LC is a 30 hp unit that will provide flow rates over 300 gpm (1,135 lpm). Compressor sizing can be a complex process involving several variables outside of the compressor's basic displacement and brake horsepower. Variables such as ambient temperature, pipe sizes, pressure drops in piping (liquid and vapor), size of tanks, and excess flow valves in each tank must be taken into consideration to make sure that the correct compressor is being selected. Generally, an average flow rate is determined based upon typical ambient conditions at the transfer site location. The highest liquid flow rates can be achieved on hot days where the ambient temperature generates a much higher product vapor pressure. Conversely, lower ambient temperatures produce lower tank vapor pressures that result in lower liquid flow rates. This can significantly change the compressor performance and must be taken into consideration when sizing a compressor for your application.

## BUILT TO MEET YOUR NEEDS

A variety of standard sealing options and mounting variations are available for each model compressor. Custom engineered packaging is available to satisfy your specifications. Send us your application conditions or your engineering specifications. We will apply the right compressor for your unloading conditions. For complete turnkey systems and installations, Blackmer will work with one of several systems providers to provide a complete system designed to meet your specifications.