

# Vapor Savings Unloading Tank Cars

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*Liquefied petroleum gas may be transferred mechanically in either of two ways: with a liquid pump or with a vapor compressor. The pump will move liquid only, and will not remove the vapor content from a tank. The compressor will remove the liquid and a large part of the vapor content from a tank, but will not develop the high pressures required for the fast filling of small tanks. Therefore, in many plants, both a pump and a compressor are required.*

In a bulk plant where a great many tank cars are unloaded, the matter of saving the vapor content in tanks being unloaded into storage is important, as otherwise the vapor left in the car goes back to the supplier when the car is returned. Some LPG suppliers attempt to make a credit allowance for vapor returned in cars, but since it is difficult, if not impossible, to make an accurate allowance, many suppliers make none. If a large number of tank cars are unloaded, and if the supplier allows little or no credit for the vapor content, a dealer should look into the possibility of installing a compressor whenever it can be shown that the compressor unit will pay for itself by the savings accrued from the vapor unloaded.

A good compressor cannot unload liquid from tank cars any faster than a good pump of equal capacity. The problem of whether to use a compressor thus boils down to the economics in vapor saving, and the pur-

pose of this article is to offer tables that will enable those who must consider this problem to get a reasonably accurate estimate of the amount of savings they can expect to receive by installing a compressor.

A natural mistake that is frequently made in estimating the savings of vapor recovered, is to assume that *all* the vapor can be drawn from the tank by the compressor. This is a misleading assumption, as drawing all of the vapor from a tank requires that it be pulled down to a perfect vacuum. This is impossible to do even with the most expensive experimental laboratory-type equipment. Actually, it is agreed that there is a practical limit of pressure reduction beyond which it is not economical to operate the compressor unit. Opinions differ on just what the practical limit is, but consensus places it somewhere between 15 and 40 lb.

The series of four tables presented herewith show savings which may be

accomplished in four cases. Table I indicates the savings if gauge pressures are reduced to 45 psig; Table II shows savings at 30 psig; Table III lists the values for 15 psig; Table IV is for 0 psig. As an illustration of how these tables are to be used, suppose propane is being handled at a temperature of 60° F, and the compressor is to be shut off when a gauge pressure of 45 psig has been reached. Check with Table I. Note a saving of 582 lb or 137 gal. The table helps further by figuring the money value of this fuel. Suppose the cost is 10 cents per gal. delivered. The table shows a saving of \$13.70. At 12 cents per gal. the saving would be \$16.40, etc. Use the delivered cost, that is, freight included.

With single-car savings of this order, a gross savings of \$1300 to \$1600 per 100 cars unloaded could be expected. The expense of running the compressor would depend upon how long it takes to unload the vapor. If

