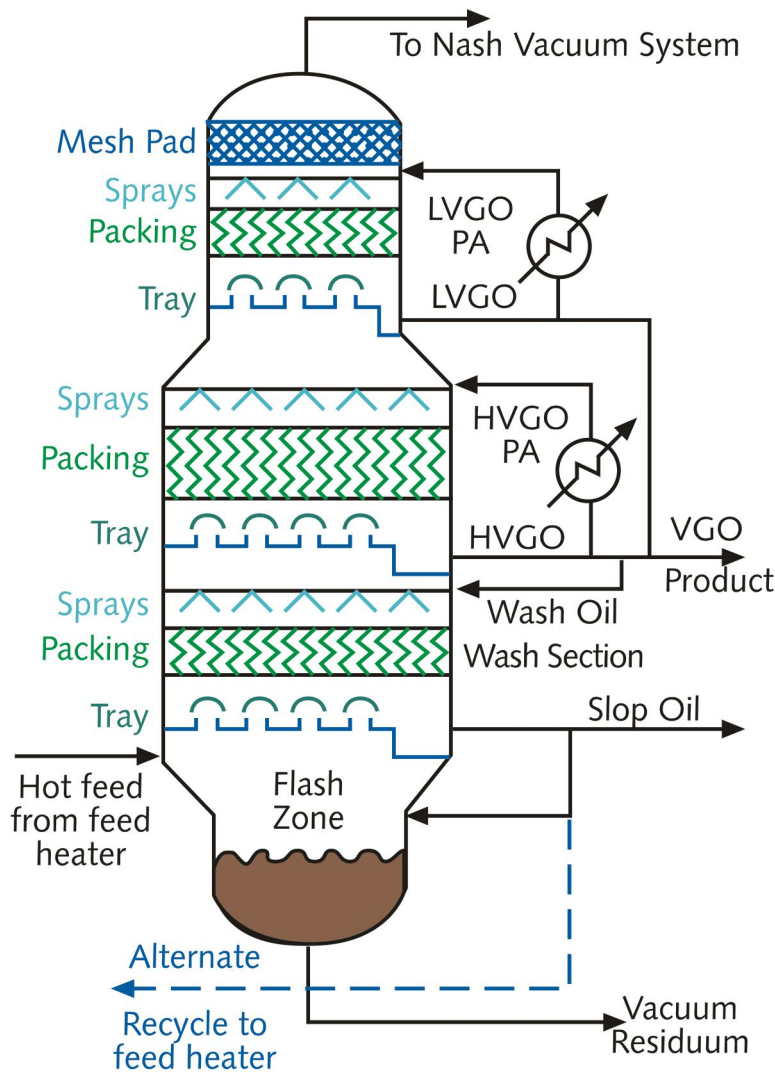


# Vacuum Distillation Columns

**Optimizing your vacuum distillation system is a complex job. Doing it right involves much more than meeting an equipment specification. The rewards in performance and cost savings over the life of the system make it very worthwhile.**



VGO = Vacuum gas oil  
 LVGO = Light vacuum gas oil  
 HVGO = Heavy vacuum gas oil  
 PA = Pump-around circuit with cooler

## Nash engineered vacuum systems for crude distillation bring you:

- Reduced operating costs
- Versatility for alternate feedstocks
- Reduced water treatment costs
- Improved environmental control
- Increased product yield
- Less or no need for stripping steam
- Ability to automate system

## Optimizing your tower vacuum system

Industrial scale vacuum distillation has several advantages. The vacuum distillation columns, such as the one shown at left, typically have diameters ranging up to 46 ft (14 m), heights ranging up to 164 ft (50 m), and feed rates ranging up to about 160,000 barrels a day.

The column's internal structure must provide good vapor-liquid contact while, at the same time, maintaining a very low pressure increase from the top of the column to the bottom. Therefore, the vacuum column uses distillation trays only where withdrawing products from the side of the column. Most of the column uses packing material for the vapor-liquid contact because such packing has a lower pressure drop than distillation trays. The packing material can be either structured sheet metal or randomly dumped packing such as Raschig rings.

The absolute pressure of 10 to 40 mmHg in the column is most often achieved by using multiple stages of steam jet ejectors. The ejectors, in turn, can be made more efficient by the addition of Nash pumps.

# Environmental Solutions - Helping You Comply With EPA and Kyoto Treaty Regulations

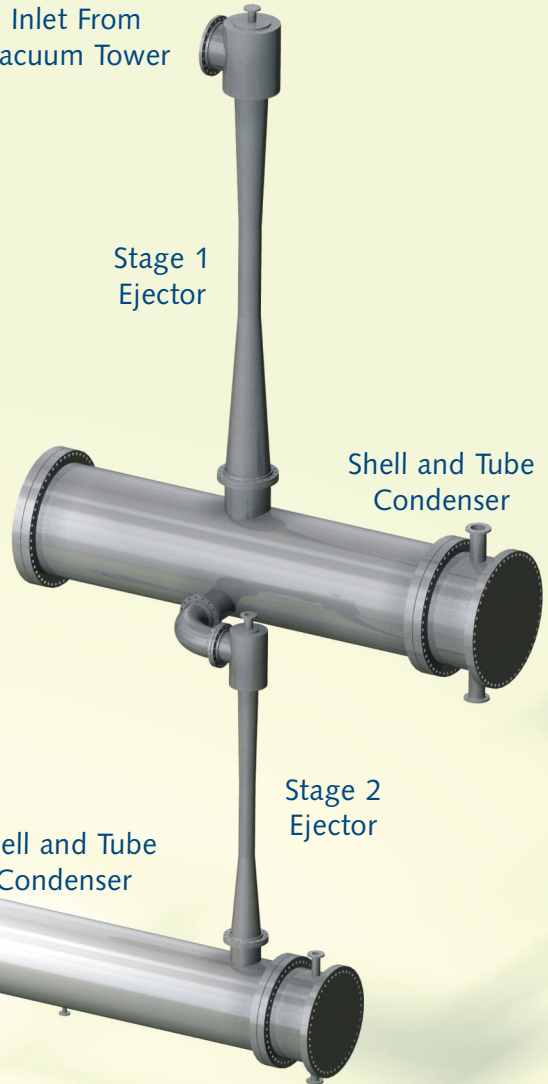


Gardner Denver Nash is committed to providing environmentally friendly solutions for your process needs. Gardner Denver Nash wants to be your partner in responsible stewardship of the environment and building more profitable refineries.

Inlet From  
Vacuum Tower

Stage 1  
Ejector

Shell and Tube  
Condenser



## Vacuum Distillation System

3 stage ejector/  
liquid ring hybrid

Stage 3  
Liquid ring  
pump system



Shell and Tube  
Condenser

Heat Exchanger



**NASH**  
**Div. of Gardner Denver**  
9 Trefoil Drive  
Trumbull, CT 06611 U.S.A.  
phone: 800 553 NASH  
+203 459 3900  
fax: +203 459 3988  
nash@gardnerdenver.com  
GDNash.com