



Chemwork

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Dear all, I am working with distillation column. My question is that, how the pressure drop changes from bottom to top of distillation column ? can you give me details.

Gokul Mahajan
GET at Adani Wilmar Limited

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Dipeeka

Dipeeka Jalan
Trainee at Elantas Beck India Ltd

The column is provided with heat by a reboiler which is continuously boiling the liquid from the bottom of the columns. And the vapors from the top of the column are continuously cooled and condensed by an overhead condenser provided at the top of the column. The heating and cooling actions of these heat exchangers are responsible for vapor liquid equilibrium conditions in the column. Also due the action of reboiler the bottom of a distillation column has highest temperature and pressure conditions. The condenser is responsible for lowest temperature and pressure conditions at the top of the column.

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Wilfredo

Wilfredo Garcia
Process Specialist at Ecopetrol

Dear Gokul,

In order to set the pressure drop across the distillation column you have to set the trays pressure drop. As an approach, we use 0.15 psi pressure drop per tray. From your shortcut simulation you may get the theoretical trays and using design practices you may obtain the "real trays", to the column top pressure, add the pressure drop above mentioned and you'll get an approximation to the real bottom operating pressure.

If you need further information, I have a paper regarding this subject in my hard disk that I'm pleased to submit to you. If you're interested, please email me a remind to wilfredo.garcia@btinternet.com

Cheers,

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Jeremy

Jeremy Goldbloom
Oil & Energy Professional

The pressure drop depends on the type of column(plate type or packed), the mechanical details and the operational hydraulic loadings of vapour and liquid traffic. A good textbook is "Design of Equilibrium Stage Processes" by Buford D. Smith. He details the calculations for most typical columns. You could also ask a tray or packing vendor such as Sulzer for their program.

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Oluseyi

Oluseyi Ogunrinola

Lead Project Engineer at Pan Ocean Oil Corporation

Everything said in the comments above are right. A little addition. Generally the lowest pressure is at the top of the column while the highest pressure is at the bottom. The column pressure profile then is based on the stage to stage pressure drop. There is a rule of thumb that is acceptable during the preliminary engineering stage. However during the detailed design, it's inevitable to contact vendor for actual train to tray pressure drop. Wilfredo gave a very reasonable preliminary estimate. It's important also to state that the cooling medium for the condenser determine the top pressure while some liquid hold up in the last / bottom stage add some head which translate to higher pressure. You may google for " Rule of thumbs for chemical engineer" you will find this material helpful.

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