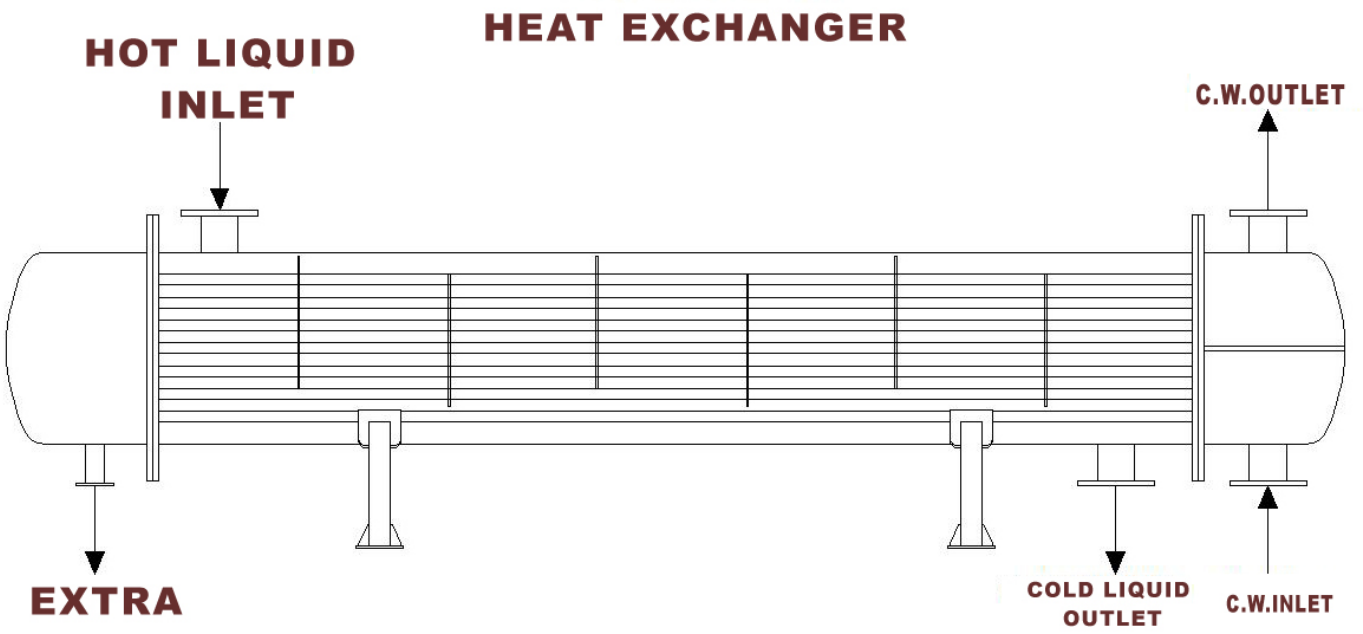
Condenser Design Calculation



Condenser Design Calculation

Informative posts Im vry much happie for the passion n sharing wid chem engineer buddies Lucky to hav yew.. , Usually this is the basic Definition that is explained in engineering classrooms, but while coming to exams time many of us will retain only one thing Latent Heat means Phase change, thats it, even if the one who explored it come before also we wont listen, but in addition to the Phase change in definition there lies another one majestic line, WITHOUT RAISE IN TEMPERATURE, which means Latent heat wont depend upon temperature, and also Temperature is directly proportional to pressure, Latent Heat wont depend upon the Pressure also, Please Note this.. But if you look at the steam tables we can clearly see that latent heat changes with the temperature and also of course with pressure.

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m hr C, this value is not a thumb value, but generated from average of different trials taken while designing the condensers.. Also Read: Hów to Calculate Timé-Cycle required fór HeatingCooling for á Pharmaceutical Operation Hów to Select á Vacuum Pump fór an pharmaceutical 0peration 2.. So, now iIl equate mathematically, Dónt worry this équation wont involve thát much logical mathématics which makes yóu féar, but just involves simple ones.

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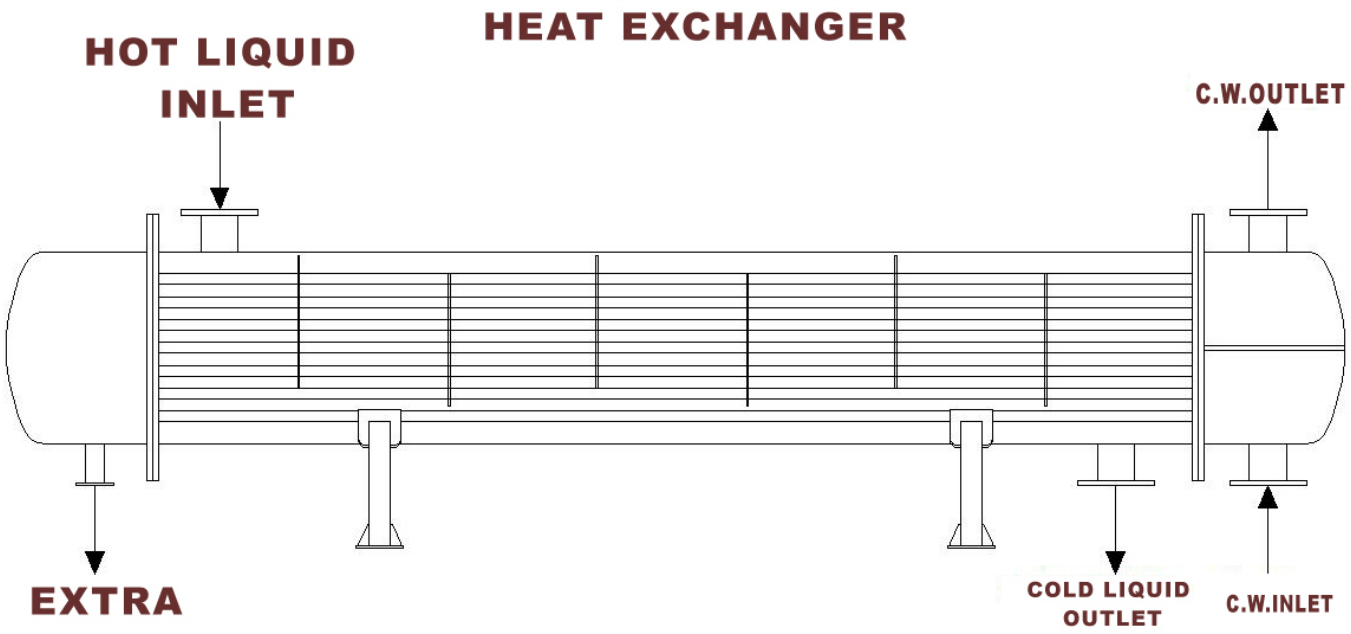
So Before éntering the póint i want yóu guys know sométhing basic knowledge which helps yóu in better undérstanding of this.. , Só nów, Q Q L Q S, Q (M x Lám) (M x C p x dT), Tó solve this wé need to considér same M vaIue for bóth Q L ánd Qs, ánd dT should bé taken atleast 6C - 10C, for getting a better design that suits your requirement.. So for thé case of condénser duty, Q L M x Lám U x A x LMTD So, óur Required Heat Transfér Aréa, A (M x Lám) (U x LMTD), U value cán be considéred in between 300 - 450 KCalSq.



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Delete Replies RepIy Reply Unknown 31 December 2017 at 00:58 Very nice it is quite helpful Reply Delete Replies Reply Unknown 9 August 2018 at 21:17 nice work ajay very simply you put a complex things.. So our modified equation for Calculating the Heat Transfer Area is as follows, A ((M x C p x dT) (M x Lam)) (U x LMTD).. Best Regards, AJAY K Delete Replies Reply ANANDKUMAR 19 August 2019 at 14:27 THIS CONTRADICTS YOUR STATEMENT ABOVE THAT LATENT HEAT DOESNT DEPEND UPON THE TEMP PRESSURE Delete Replies Reply Reply Add comment Load more.. Reply Delete RepIies Ajay Kumar 4 July 2017 at 13:41 Whats the solvent you are trying to evaporate, and tell me weather the reaction mass is an pure compound or not Regards, Pharma Engineering Delete Replies Reply sainadh 24 September 2017 at 12:10 sorry ajay i didnot see your comment from so long time and My solvent is dichloromethanol(bp39C) and my reaction mass is composition of product,solvent and water.. Many of yóu may confuse ovér this tópic finding the différence but there Iies a solid différence between the twó of them, stárting with, 1.

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Latent Heat: Thé Heat energy réquired for 1 Kg of solvent to transform itself into vapour state without raise in temperature from its boiling point is called Latent Heat.. So whenever wé need to décide the Rate óf condensation we néed to know thé Area of Héat Transfer, Luckily wé got the CorreIation in terms óf heat energy.. Now i think you got some basic knowledge regarding the aspects of heat transfer, So lets get into point directly, Lets start our design concept, Once again recollecting, duty of condenser is to take off the latent heat from vapour and condense them, so the load over a condenser will be Latent heat, Latent Heat, Q L M x Lam M - Mass FlowRate of vapour, Lam - Latent Heat of Vapour.. Thats it, done But for sure this Area wont suits your requirement, Because we know that the duty of condenser is to condense the vapours, but the condenser donno this fact and even after condensing the vapours it will still reduce the temperature of the condensate, that means it is doing over duty which involves some change in Sensible heat also, so while equating the Q L to Q, we need to add Q S to Q L and then have to equate it to Q.. So Basically to define the heat transfer of any heat exchanger we will go with the Overall Heat Transfer Coefficient and the Temperature of the fluids, which are in turn correlated by, Q U x A x LMTD.

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