Close Approach Heat Exchangers

A close approach heat exchanger is a special case design in which the two fluids exchanging heat end up leaving the heat exchanger ports at temperatures that are nearly identical. These heat exchangers are virtually always counter-flow designs in which one flow is from left to right, and the other right to left.

An example would be a case where fluid A enters its side of the heat exchanger at 200 degrees F and leaves at 70 degrees F. Meanwhile fluid B enters its side of the heat exchanger at 68 degrees F and leaves at 198 degrees F. These two fluids approach each other very closely at both ends of the exchanger (i.e. 70 vs. 68 and 200 vs. 198).

To accomplish this requires an especially effective design, specifically optimized for this purpose. While the example numbers given above are purely hypothetical, we have a great deal of experience in designing heat exchangers for this type of application. Along the way we have learned the intimate details needed in these designs and have accumulated much data and intellectual property of various sorts which we can offer users.

Without going into specifics, it can be said that at least two general approaches are possible. The first is to combine a series of available standard heat exchangers together in such a way as to achieve close approach. The other method is to design and build a heat exchanger specifically for the application, which will perform much better and be far more efficient, and will cost considerably less depending on circumstances.

If several such heat exchangers are needed, or if large scale production is contemplated the savings then can be considerable.

We are not aware of commercial offerings today which exceed the performance of our designs and we note limitations in performance prediction software offered on the web by various vendors for their heat exchangers, especially in cases where mixed phase flows are involved on both sides of the heat exchanger. These are areas in which we have actual data from applications available to share.