

Following are some of the basic and more obvious considerations that will favor DEEP coil technology over the Micro-channel Heat Exchanger technology.

- Basic Cost – The micro-channels are made from extruded aluminum non-circular fluid channels of extremely small width (hence the name micro), about 1/8<sup>th</sup> of inch. Fan folded ribbon-type fin material is squeezed between the tubes. The fin material is then brazed to the tubes in large ovens. Similarly, the fluid channel tubes are brazed to the header. This is a precision manufacturing process, which is inherently expensive. This transcends into higher basic cost of the product relative to DEEP coil.
- Long Production Volumes – Due to its complexity, the micro-channels require large volume production runs. This makes it unsuitable for small volume items or for frequent engineering design changes. Accordingly, it is suitable only for large manufacturers with established matured product lines. It will not be viable option for specialty manufacturers, in retail consumer, light commercial, industrial and scientific markets
- Limited Flexibility in Refrigerant/Fluid Circuitry – Unlike the DEEP coil, due to the nature of the micro-channels, there is very little flexibility in arranging the fluid circuitry to achieve the desired velocities. Velocities can be significant in both refrigerant and glycol-water mix to maintain non-laminar flow. It can be important consideration in two phase fluids common in refrigeration.
- Prone to Icing – The narrow air channels inherent in the micro-channels are prone to icing in the evaporator or heat pump application. Whereas, the DEEP coil provides wide fin and tube spacing, fewer crevices, where condensate may stagnate and form ice.
- High Shipping Cost – The micro-channels are often single row heat exchangers, which results in large face area. To make the end product compact these coils are often bent into “U” or “C” shape. This increases the shipping volume, and, consequently the cost. Whereas, the DEEP coils will always have flat configuration and can be shipped relatively at much smaller cost.
- Rigid Design & Manufacturing Constraints - Not Suitable for niche Markets.
- Large Capital Needs - Given the enormous capital needs, the micro-channels are made by few large manufacturers. They are not a viable option to medium, or start-up manufacturers. For small or medium size end-product OEMs, the size disparity creates supply chain constraints.
- Inadequate Energy-Efficiency Gains – Considering the cost and other constraints, the micro-channels provide inadequate energy-efficiency gains. Whereas, the DEEP Coil technology provides up to 50% gains in fan power and compressor power consumption, concurrent with OEM cost savings and operating cost savings to the consumer.

