DELTA T HEAT EXCHANGERS
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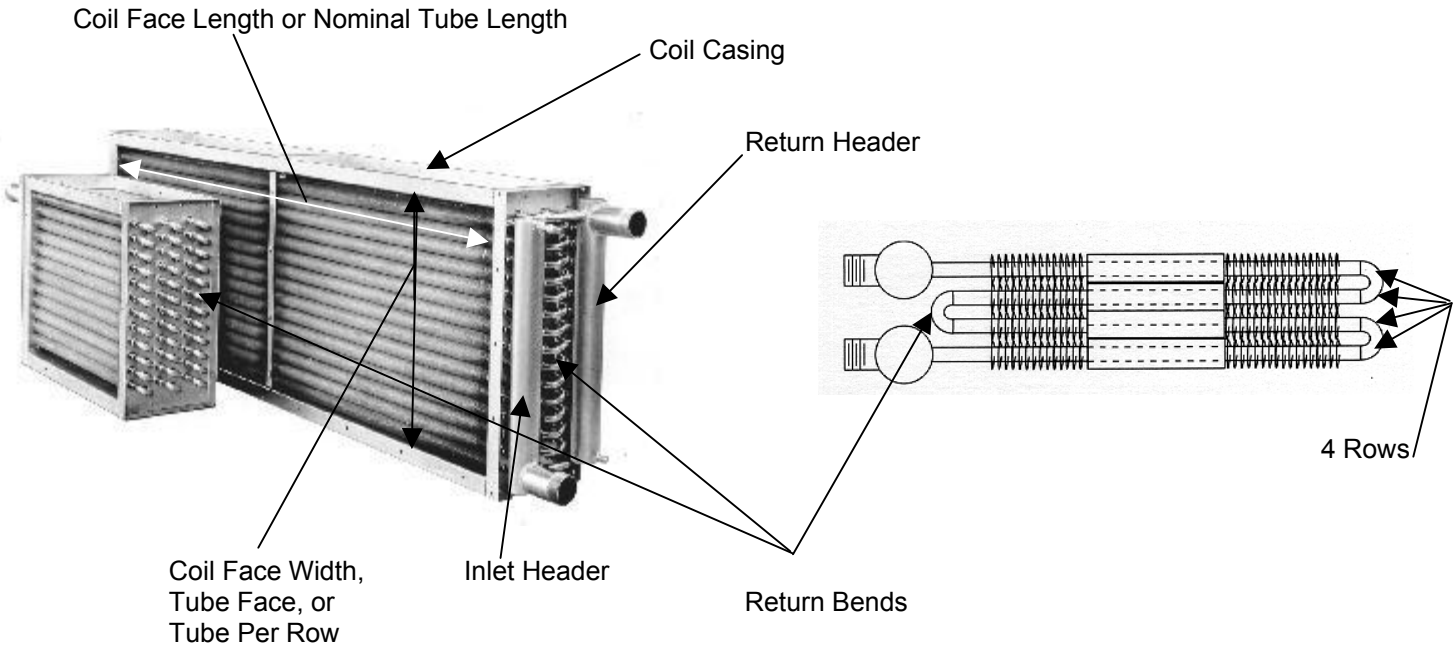
COIL NOMENCLATURE



Definitions:

TubeFace: The number of individual tubes in the cross-section of the duct in one row. (also called tubes per row)

Face Length: The length of the individual tube exposed to the air stream in the cross-section of a duct. This value can be the actual length measurement or a nominal length. (also called nominal length, abbreviated as FL, NL, NTL)

Rows: The number of “tubefaces” of tubes that the air flows over, perpendicular to the duct cross-section

Return Bends: U-shaped tubes welded or brazed to the finned tubes to direct the fluid in a particular path through the coil.

Headers: The manifold that feeds the fluid down the tubes and collects the fluid exiting the tubes. The header can be a pipe or fabricated channel.

Nozzles: The inlet and outlet piping that feed the header.

Casings: The structural support that provides the strength to the coil. The casings that run parallel to the tubes are called side casings and the casings that run perpendicular to the tubes are called end casings. Casings often have mounting holes to allow ducting to be bolted directly to the coil.

To Determine Number of Rows:

Count the number of “tubefaces” that the air flows over. The rows are counted in the perpendicular direction to the direction that the tubeface is counted

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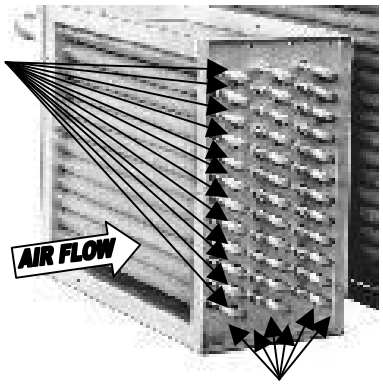
To Determine Tube Face:

- Determine the air flow direction and identify the row of tubes that the air flows over, first.
- Count the number of tubes in the first row of the coil face
- Count the tubes in the second row
- If there is one fewer tube in the second row than in the first row, then the tube face is expressed as the number of tubes in the first row
- If the second row has the same number of tubes as the first row than in the first row, then the tube face is expressed as the number of tubes in the first row plus 0.5

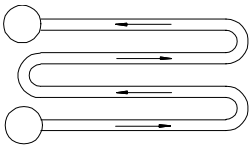
eg.: 1. 12 tubes in the first row and 11 tubes in the second row – Tubeface is 12
2. 12 tubes in the first row and 12 tubes in the second row – Tubeface is 12.5



6 ROW

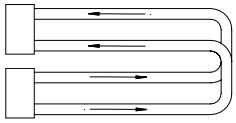
Passes/Circuiting:

The number of passes that the fluid makes across the air stream is a function of the heat exchanger design. The available fluid supply and required thermal performance lead to the determination of how to direct the fluid through the heat exchanger. There are three ways to express the flow pattern through a coil; passes, velocity, and circuiting.


Four Pass
Single Velocity
Full Circuit

The number of passes is defined as; the number of times the fluid flows (inside the tubes) from one end of the heat exchanger to the other. If the fluid flows in one end of the coil and out the other end of the coil it is considered “one pass”. If the fluid flows in one end of the coil and, at the other end of the coil, is returned back to the end it entered it is a “two pass” coil.

Another way of describing the pass arrangements is to refer to the coil “**velocity**”. Considering one tube circuit of a 4 row coil that has 4 passes, the fluid travels down one row, back the next row, down the third row and back the fourth row. This is called a **single velocity** coil because the fluid is fed down only one full row of tubes at a time. If the fluid is fed down two rows of tubes and back two rows of tubes (4 rows / 2 pass) this is called **half velocity**. If the fluid is fed down only half of the tubes in the face (or half a row), it is referred to as a **double velocity** coil. (In the case of a 4 row , double velocity – there would be 8 passes). The velocity designation is determined by (number of passes ÷ number of rows).


Two Pass
Half Velocity
Double Circuit

A third way to express the same concept is by specifying the “**circuiting**”. Circuiting refers to the number of rows (or part of row) that is fed by one fluid pass. For example, in a four 4 / 4 pass cooler, the fluid is fed down a full row and is therefore a **full circuit** coil. In a 4 row / 8 pass coil the fluid travels down and back half of each tube row, eight times and is a **half circuit** coil. . If the fluid is fed down two rows such as in a 4 row / 2 pass coil it is a **double circuit** coil. The circuiting designation is determined by (number of rows ÷ number of passes).

To Determine Passes or Circuiting:

Count the number of tubes fed by the inlet header and divide that number by the tube face. Divide the number of rows by the number determined above. Round this to the nearest whole number. This is the number of passes.